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Report 2269

FAMILY OF MILITARY ENGINEER
CONSTRUCTION EQUIPMENT (FAMECE)
PROTOTYPE QUALIFICATION
TEST-GOVERNMENT (PQT-G)
TEST REPORT

by Arthur B. Follansbee, et al. H. C. H. L. S. H

March 1979

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U.S. ARMY MOBILITY EQUIPMENT
RESEARCH AND DEVELOPMENT COMMAND
FORT BELVOIR, VIRGINIA

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29. ABSTRACT (Continue on reverse olds if necessary and identify by block number)

 $^\mathtt{L}$  The PQT-G generally confirmed that FAMECE meets or is capable of meeting most criteria established in the MN (Materiel Need), the detailed test plans, or other standards. With few exceptions, FAMECE was subjected to the testing as prescribed by the test plan. In other cases, testing and the corresponding results were adversely affected by such variables as weather conditions and operator experience. The following tests were conducted:

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Rail transportability, Each of the eight types of FAMECE work sections in combination with a power section was rail-impact tested. Inspection and further vehicle testing revealed no failure or damage attributable to the rail test. The criterion that states FAMECE be designed to withstand the shock and vibration of a rail impact (hump) was met. The criterion specifying that minimal disassembly was essential in order to prepare the vehicles for rail shipment was also met.

Highway transportability. Actual movement by highway between test sites, in lieu of testing, revealed no resulting vehicle damage. However, the overall vehicle shipping widths exceeded the allowable limits in 49 states; the criterion is met but the overwidth condition restricts travel with respect to state law.

Marine transportability; Observations and results of other tests indicate that the criterion is met.

Endurance: Testing results were generally in compliance with MN criteria. Fuel and oil consumption was normal; some infrequent coupling problems were experienced because of dirt in the mechanism; some incidents and minor vehicle damage were recorded resulting from operator errors. In addition, visibility and light illumination presented some problems to operators of the dozer, dumper, and grader.

Safety; With certain exceptions, the criterion requiring FAMECE to be designed according to safety engineering principles was met.

Human factors observations revealed minor problems with some control locations, display, or visibility. Noise levels exceeded those allowable levels specified in MIL-STD-1474A, thus requiring the use of hearing protection by on-board personnel. Overall FAMECE design generally conforms to criteria.

Maintainability, characteristics were found to be generally acceptable.

Reliability and durability. At the MERADCOM Test Area, approximately 6,000 test hours were logged; 139 mission failures were reported. For the total vehicles tested, the resulting MTBF was 43 hours. The resulting 10-hour mission reliability for the total vehicles tested was 0.79.

#### SUMMARY OF RESULTS

The results of the PQT-G generally confirmed that FAMECE meets most criteria established in the Materiel Need (MN), the detailed test plans, or other standards. With few exceptions, FAMECE was subjected to the testing as prescribed. In other cases, testing and the corresponding results were adversely affected by such variables as weather conditions and operator experience. It was also necessary to suspend PQT-G prior to completion of the total scheduled test hours.

- Rail transportability testing resulted in a minor weld failure with no damage to the vehicle. Each vehicle started afterwards and was driven away.
- Highway transportability testing revealed no resulting vehicle damage. However, the overall vehicle shipping widths exceeded the allowable limits in 49 states.
- Marine transportability testing was not conducted in the prescribed manner since PQT-G was terminated.
- Endurance testing results were generally in compliance with MN requirements. Fuel and oil consumption was normal; some infrequent coupling problems were experienced because of dirt in the mechanism; some incidents and minor vehicle damage were recorded resulting from operator errors. In addition, visibility or lighting presented some problems to operators of the dozer, dumper, and grader.
- <u>Safety</u> analysis, based on test observations and equipment performance, revealed certain deficiencies and shortcomings requiring correction
- Human factors observations revealed minor problems with some control locations, display, or visibility. Noise levels exceeded those allowable levels specified in MIL-STD-1474A. In addition, some difficulties or hazards were encountered by operators during ingress/ egress, normal operations, coupling/uncoupling, and maintenance.
- Maintainability characteristics were found to be generally acceptable. Some design characteristics and components adversely affected maintenance and supply requirements. A requirement for additional special tools was established.

• Reliability and durability. At the MERADCOM Test Area, a total of 6,006 test hours were logged during the August 1977 to March 1978 test period. 139.25 mission failures with the mission criticality factor applied were reported by the FAMECE scoring conference. For the total of vehicles tested, the resulting MTBF was 43 hours. The criteria stated that the MTBF would be comparable to existing military construction equipment. This parameter is to be determined by TRADOC. The resulting 10-hour mission reliability, considering mission criticality factors, for the total vehicles tested was .79.

The durability parameters are not presented; durability failures have not been identified by the FAMECE scoring conference.

 Initial and final inspection revealed several required maintenance actions which were deferred until after testing.



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#### FOREWORD

This test was sponsored by the Project Manager, Family of Military Engineer Construction Equipment and Universal Engineer Tractor (PM, FAMECE/UET) under the direction of DARCOM.

MERADCOM was responsible for preparing the test plan, conducting the test, and preparing the test report with the guidance and monitorship of TECOM.

#### ACKNOWLEDGMENTS

The report was prepared by a MERADCOM test team consisting of the following members:

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Otto L. Matherny and
Christopher Irby, Jr. - Reliability Analysis

The authors express special thanks to Mr. James H. Hartwell, TECOM, and Mr. Paul R. Cushatt of MTD, APG, for their expert guidance throughout this test.

Ed. note: In order to meet customer requirements, the format of this report varies slightly from that of the usual MERADCOM report.

# METRIC CONVERSION FACTORS

Approximate	Conversions	to	Metric	Measures	

Symbol	When You Know	Multiply by	To Find	Symbol	
		LENGTH			•
in	inches	•2.5	centimeters	cm	
ft	feet	30	centimeters	cm	
yd	yards	0.9	meters	m	
mi	miles	1.6	kilometers	km	
	-	AREA			
in <sup>2</sup>	square inches	6.5		cm <sup>2</sup>	ē
ft <sup>2</sup>	square feet	0.09	square centimeters	m <sup>2</sup>	
yd <sup>2</sup>	square yards	0.8	square meters	m <sup>2</sup>	
mi <sup>2</sup>	square miles	2.6	square kilometers	km²	
	acres	0.4	hectares	ha	
		IASS (weight)			
02	Ounces	28			
b	pounds	0.45	grams	9	
	short tons	0.45	kilograms metric tons	kg	
	(2000 16)	0.9	metric tons	,	-
		VOLUME			
sp	teaspoons	5	milliliters	ml	
bsp	tablespoons	15	milliliters	ml	-
loz	fluid ounces	30	milliliters	ml	
	cups	0.24	liters	L	
it	pints	0.47	liters	L	
lt.	quarts	0.95	liters	L	
al	gailons	3.8	liters	L	
13,	cubic feet	0.03	cubic meters	$m_3$	~
d <sup>3</sup>	cubic yards	0.76	cubic meters	m <sup>3</sup>	,
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	temperature	subtracting	temperature		-

<sup>• 1</sup> in = 2.54 cm (exactly).

	23		Approximate Conve	rsions from Met	ric Measures	
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		kg	kilograms	2.2	pounds	
	=		metric tons (1000 kg)	1.1	short tons	
			•			
	0					
				VOLUME		
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	•	L	fiters	2.1	pints	pt
		L	liters	1.06	quarts	qt
	-	L	liters	0.26	gallons	ga
		m <sup>3</sup>	cubic meters	35	cubic feet	ft <sup>3</sup>
		m <sup>3</sup>	cubic meters	1.3	cubic yards	yd
	•					
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# FAMILY OF MILITARY ENGINEER CONSTRUCTION EQUIPMENT (FAMECE) PROTOTYPE QUALIFICATION TEST-GOVERNMENT (PQT-G) TEST REPORT

#### 1. INTRODUCTION

#### 1.1 BACKGROUND

The following general background information is from paragraph 6 of the revised MN (ED) (QMR).

US Army operational concepts for the 1975 to 1985 time period envision strategic forces which are quickly deployed to any part of the world. Although general war is possible, it is more probable that the US Army must conduct land operations in undeveloped areas, areas which will emphasize the need for major and expedited base construction. Further, it is envisioned that within the area of operations, the US Army tactical operations will be typified by highly mobile ground forces utilizing an increased number of aircraft for transporting troops, equipment, and logistical supplies. These concepts will require engineer units to move and construct air landing facilities, ports, bases, and routes of communication in support of ground operations more rapidly than in the past. In addition, the increased use of air lines of communication will generate a corresponding increase for the rapid construction of air landing facilities and associated supply handling and storage complexes. Reference is made to letter FOR DS SSS, Assistant Chief of Staff for Force Development, Department of the Army, 9 July 1965, wherein the policy was established for the reduction in size and weight of equipment for the US Army. majority of existing military earthmoving construction equipment is too heavy and cumbersome to be air dropped, lifted by helicopters, or even air transported in some cases. Road speeds are generally far

below convoy speed while many items of equipment must be transported on trailers. Few provide for rapid changing of the construction task capability. Consequently, a family of construction equipment must be developed that is lighter in weight with a high work capacity, capable of being parachute delivered and airlifted by helicopters, utilizes a standard power section, provides construction flexibility, and is capable of satisfying the construction equipment requirements of airborne, airmobile, and the many conventional divisional and nondivisional combat engineer units. The development of this family of engineer construction equipment utilizing high-density standard power section components and proven construction work section components is both economical and practical and will overcome, to a large degree, the severe logistical burden of supplying repair parts to a multitude of makes and models or existing military construction equipment. Further, use of a standard power section will significantly reduce maintenance and operator training requirements and make engineer equipment more compatible with Army maintenance capabilities.

The FAMECE program was initiated and successfully passed through its Conceptual Phase and into the Demonstration and Validation Phase. A joint Development Test (DT) I and Operational Test (OT) I on two competing contractor versions of the scraper and grader vehicles was conducted by APG, USAARENBD, TRADOC, and USACEBD personnel at APG from 30 November 1973 to 20 August 1974. The results of the APG Engineering Phase of the program are documented in Appendix XVII of Report APG-MT-4528, September 1974.

Clark Equipment Company (CEC) emerged from the Validation Phase competition as the successful contractor for the Full-Scale Development (FSD) Phase. Two early prototypes (loader and dumper) were manufactured and specific performance and endurance testing conducted as part of Research and Development Acceptance Testing (RDAT). The loader and dumper were then transferred to Yuma Proving Grounds for environmental and air-drop testing in September 1977.

In accordance with current SIDTC policy, Engineer Design Tests of the FSD FAMECE vehicles were conducted by CEC at their Benton Harbor, Michigan, facilities from September 1976 to November 1977. During these tests, the required DT II (EDT) performance and productivity data were generated. DARCOM on 10 October 1976, directed MERADCOM to conduct DT II PQT-G at Fort Belvoir, Virginia. In a subsequent letter, 29 July 1977, DARCOM stated that TECOM would be responsible for the conduct of the tests and that the tests would be accomplished in the same manner as testing at one of the TECOM subordinate installations. TECOM, in letter DRSTE-AR dated 1 March 1977, further directed APG to monitor and assess the adequacy of the tests conducted by MERADCOM.

In addition to two early-on prototypes (dumper and loader work sections and power sections), CEC has manufactured 13 power sections and 14 work sections for testing, conducted RDAT at their facility, and reported the test results to the Project Manager's Office (PMO). Beginning in July 1977, the FAMECE test vehicles were transferred to MERADCOM for PQT. After the PQT was suspended on 17 March 1978, the test items were inspected and repaired to serviceable condition for OT at Fort Bragg, North Carolina. As a result of PQT and earlier testing, the contractor provided a number of modifications, which were made prior to OT.

# 1.2 DESCRIPTION OF MATERIEL

The FAMECE is a sectionalized, articulated- or hinge-steering, pneumatic-tire, earthmoving system to be used by airborne, airmobile, and other combat engineer units to accomplish construction tasks under varying climatic conditions from arctic to tropic, over typical terrain, in all theaters of operation, and during daylight or at night. The system consists of one standard power section and several types of construction work sections. Each vehicle consists of a standard power section and one of the following construction work sections:

- a. Dozer of 20,000-pound-drawbar-pull capacity with semi-U blade and back-rip scarifier teeth (Figure 1.2-1).
- b. Loader of 20,000-pound-drawbar-pull capacity with multisegment bucket of 2-1/2-cubic-yard capacity (Figure 1.2-2).
- c. <u>Scraper</u> of 10-cubic-yard struck capacity, self-loading, but also capable of being push-loaded by the dozer (Figure 1.2-3).

- d. Grader with side-shifting, 13-foot blade and removable scarifier (Figure 1.2-4).
- e. Dumper of 10-ton capacity capable of hauling troops and general cargo (Figure 1.2-5).
- f. Pneumatic-Tire Tamping-Foot Compactor (T.F. Compactor) capable of compacting at a minimum speed of 7.5 mi/h (Figure 1.2-6).
- g. Pneumatic-Tire Smooth-Drum Vibratory Compactor (S.D. Compactor) capable of exerting compaction pressures up to 150 pounds per linear inch of roller width (Figure 1.2-7).
- h. Distributor, 2500-gallon capacity, capable of spraying water 35 feet from the spray head and in a pattern up to 70 feet in width (Figure 1.2-8).

The standard power section is compatible with and adaptable to the construction work sections for construction tasks such as loading, excavating, grubbing, dozing, scraping, hauling, grading, dumping, spreading, and soil compaction. Each power section and construction work section is capable of being airlifted as a separate load by CH-47 Army medium-lift helicopters of the 1975 time frame. A complete vehicle is capable of being transported as an internal load and air dropped from US Air Force aircraft (C-130, C-141, and C-5A). Each standard power section and construction work section is provided with lifting and tiedown devices to permit worldwide movement by highway, rail, ocean, amphibious, and inland-waterway carriers with no (or a minimum of) disassembly.

Table 1.2-1 shows the test items received and hours of test at MERADCOM. Once coupled, each combination of power section and work section remained as one vehicle for the duration of the test.

#### 1.3 TEST OBJECTIVES

The objectives of the MERADCOM tests were: to measure the degree of compliance with the criteria detailed in the revised MN, to measure and analyze the performance of the FSD test items, and to address the critical issues stated by DA in the FAMECE Program memorandum which were included in the AMSAA test design plan. The following were identified as critical test areas for DT II:

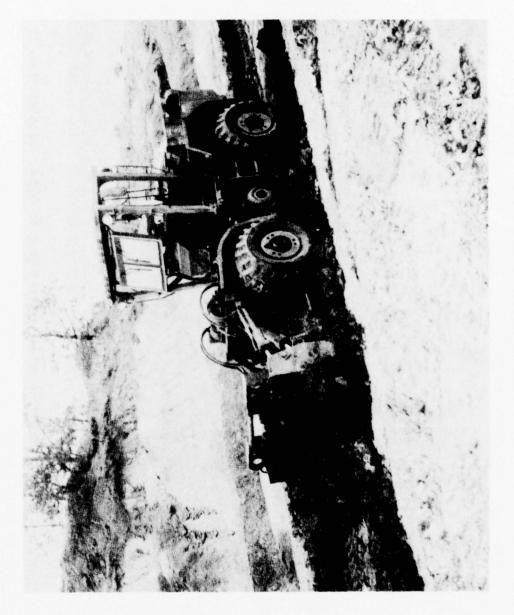


Figure 1.2-1. FAMECE dozer vehicle, three-quarter front, roadside view.



Figure 1.2-2. PAMECE loader vehicle, three-quarter front, curbside view.

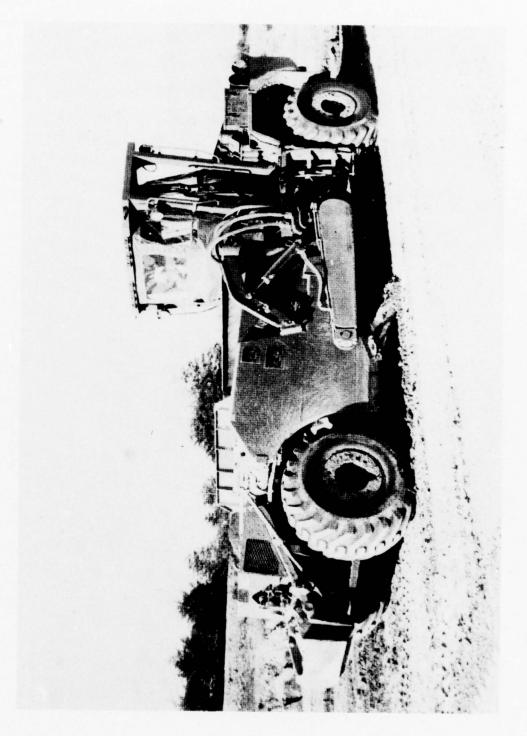
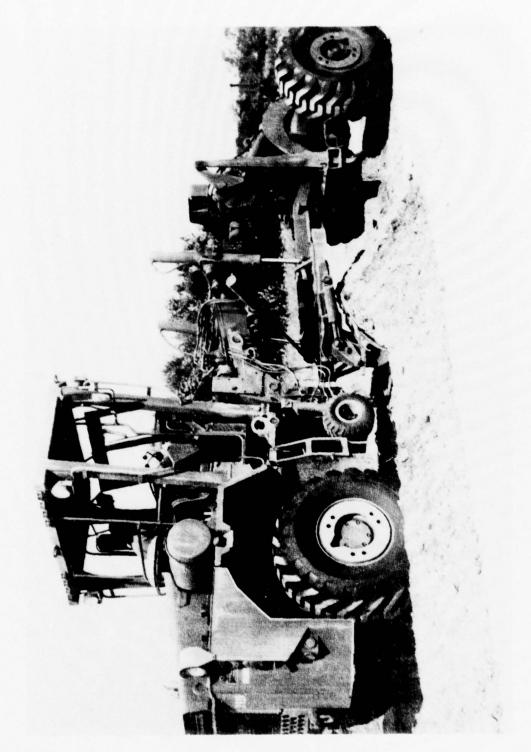


Figure 1.2-3. FAMECE scraper vehicle, three-quarter rear, curbside view.



FAMECE grader vehicle, three-quarter rear, curbside view.

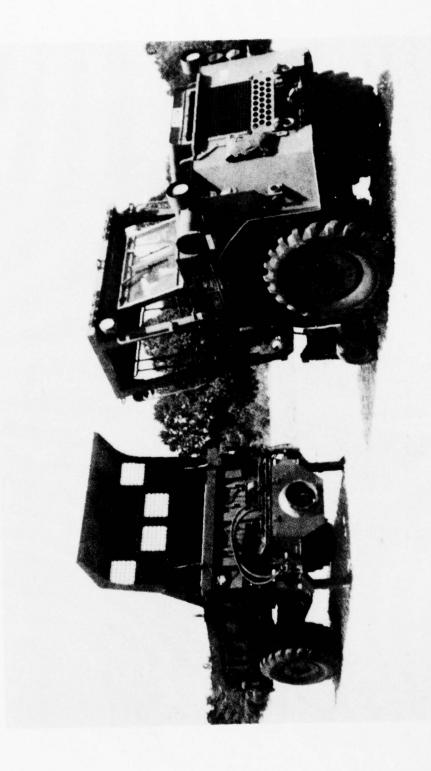


Figure 1.2-5. FAMECE vehicle uncoupled into dumper work section and power section.

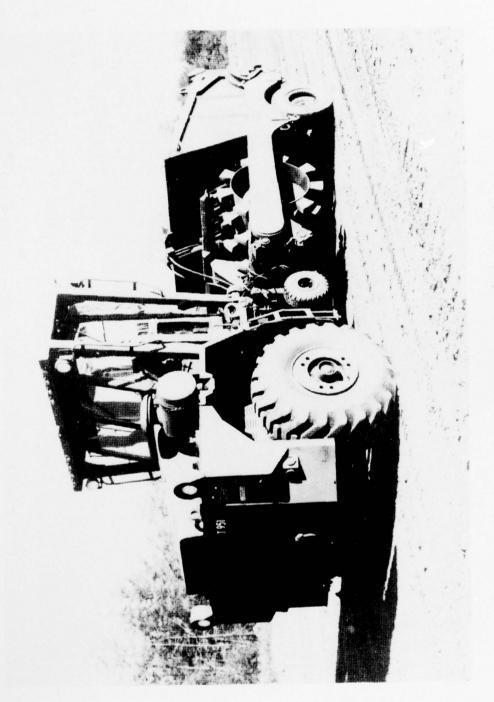


Figure 1.2-6. FAMECE tamping-foot compactor, three-quarter front, roadside view.

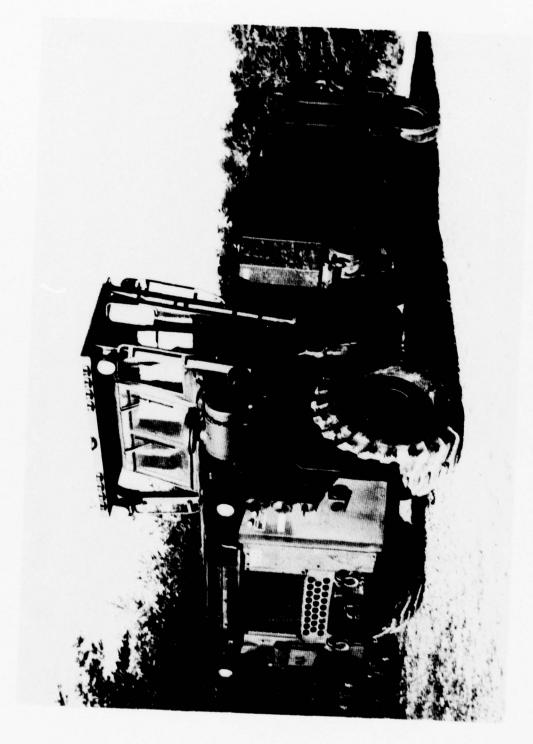


Figure 1.2-7. FAMECE smooth-drum compactor, three-quarter front, roadside view.

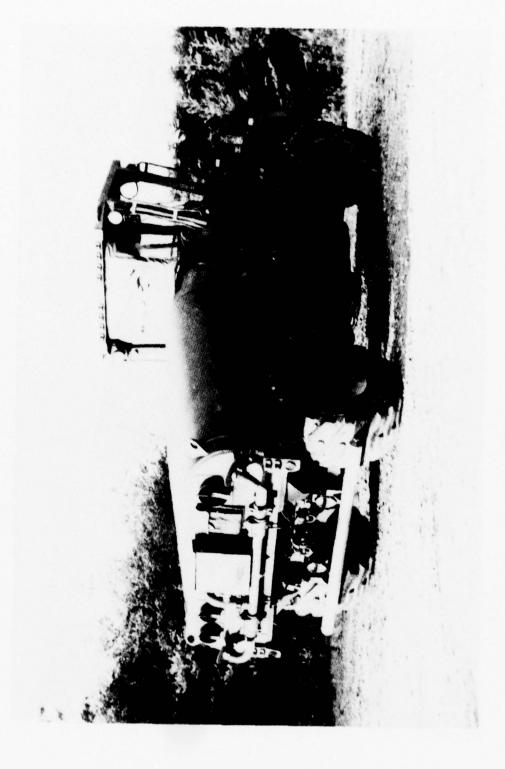


Figure 1.2-8. FAMECE water distributor, three-guarter rear, curbside view.

Table 1.2-1. FAMECE Test Data

							Test Hou	irs Com	Hours Completed			
					Hours When Received	When	Section)	Section Meter)	Work n Hours			
Unit	MERA Num PS	MERADCOM Number PS WS	Serial Number PS WS	Number WS	(Reported by CEC) PS WS	rted EC) WS	Mork S	Power (Hour	Total Sectio	Date Received	Rece	ived
Dumper (I)	T935	T936	446X108	467X102	19.0	14.1	1047	1072	1061	21	Jul	77
Dumper (II)	T959	T960	446X113	467X104	25.4	20.4	374	007	395	30	30 Nov	77
Pumper (III)	None	T942	None	467X103	None	17.2	200	1286	231	2	2 Sep	77
Loader	T937	1966	446X105	465X102	152.0	13.3	936	9601	676	26	26 Aug	77
Grader (I)	T939	T940	446X104	471X101	272.0 119.5	119.5	776	1054	895	15	Aug	77
Grader (II)	1949	T950	446X116	471X102	429.0 429.0	429.0	110	539	542	6	Feb	78
Dozer (I)	T943	T944	446X107	446X107	78.1 140.5	140.5	743	832	884	15	15 Sep 77	77
Dozer (II) *	T945	1946	446X109	466X102						Not	rec	Not received
Scraper (1)	T955	T956	446X114	464X102	28.0	19.5	233	251	242	18	18 Nov 77	77
Scraper (II) *	T947	T948	446X111	464X101								
Distributor (I)	T941	T938	446X106	468X101	66.3 120.7	120.7	830	968	951	2	2 Sep 77	12
Distributor (II)	T957	T958	446X115	468X102	10.3	8.6	237	247	247	22	22 Nov	77
TF Compactor	T951	T952	446X110	469X101	108.9	6.98	293	405	330	00	Nov	77
SD Compactor	T953	T954	446X112	470X101	62.0	64.1	273	335	337.6	16	16 Nov	77
												-

PS - Power Section WS - Work Section \* Not tested at MERADCOM.

- a. Do the FAMECE vehicles possess satisfactory RAM-D characteristics or do they demonstrate satisfactory progress toward that goal?
- b. Can the FAMECE vehicles be satisfactorily air-transported, air-dropped, and helicopter-lifted?
- c. Do the FAMECE vehicle systems (i.e., the complete family of vehicles, the operators, and the maintainers) exhibit satisfactory performance in areas such as:
  - (1) Coupling and uncoupling?
- (2) Production rates (the rate at which the vehicle

  - (4) Safety?
  - (5) Human factors?
- d. Can the FAMECE perform satisfactorily in adverse environments?

In addition to the above critical issues, it was essential to make an assessment of the training plan for operators and maintenance personnel for DT II, since this plan will form the basis for training additional personnel (key personnel and operators). Data collected, comments, and proposed corrective action on readability of manuals and instructions were evaluated, and the need for special training equipment was determined.

Similarly, an assessment of the maintenance-support plan was made to determine its adequacy and compatibility with existing concepts of maintenance support. Specifically, data generated concerning scheduled and unscheduled maintenance during DT (e.g., breakdowns, times to repair, parts consumption, and adequacy of tools and test measurement and diagnostic equipment) were evaluated with regard to warranty requirements and other limitations.

MERADCOM recognizes that all of the critical issues could not be addressed fully in DT II, but the results should prove important to the IER. In addition, MERADCOM, following SIDTC policy, did not duplicate prior valid contractor testing.

#### 1.4 SCOPE OF TESTING

DT II provided data required for an independent evaluation of the state of the FAMECE program at the end of the FSD Phase. This evaluation will assist the Army planners in deciding whether the FAMECE should enter the production phase. With time and cost effectiveness in mind, it was determined that the two phases of the FAMECE DT II (i.e., EDT and PQT) would be conducted separately. The EDT, or RDAT, was performed by CEC, the developer contractor; the PQT related to the RAM-D was performed by MERADCOM. Some of the air-drop tests were conducted concurrently with PQT at Yuma Proving Grounds and NARADCOM. (The remaining airtransportability tests will be conducted by the Army Aviation Communication Electronics Board (ACE) at the completion PQT at MERADCOM was performed according to the approved test plan with changes during the test coordinated with the FAMECE TIWG and recorded. The actual amount of testing at MERADCOM is shown in Table 1.2-1. Concurrent with the PQT-G, CEC conducted approximately 1200 hours of PQT-C at their Benton Harbor, Michigan, test site involving the dozer, scraper, and grader vehicles (summarized in paragraph The contractor's test plan was extracted from the approved DTP with TECOM, AMSAA, and PM FAMECE representatives onsite monitoring all testing. Incidents were reported using the CEC FAMECE Failure Report (FFR) format which includes the same information as the DARCOM EPR. Maintenance actions and times were recorded in the MERADCOM MTL format and were added to the automated data base. Contractor input is distinguished from MERADCOM input by a notation or reference to FFR in the printout "remarks" column. A contractor test report addresses results of the PQT-C for the three test items.

#### 1.4.1 Test Sponsor

At DARCOM direction, MERADCOM performed the PQT in a customer relationship with the PM, FAMECE. As the customer, the PM, FAMECE provided the test items, program funding, spares, manuals, and special tools. The PM acted as the interface between MERADCOM and the contractor for required technical information and support.

#### 1.4.2 Prototype Qualification Test (PQT)

MERADCOM prepared the PQT portion of the DT II test plan, conducted the planned testing, collected and processed data, and wrote the test report. As directed by DARCOM, a close working relationship was maintained with HQ TECOM throughout the test program. TECOM also provided an onsite monitor for the duration of the test. As an endurance test, the tests were conducted in 100-hour cycles. Testing within the cycle was done according to the task percentages specified in the MN mission profiles and according to Appendices III to X of the detailed test plans. Although the test was

suspended before the total planned hours accumulated for some FAMECE vehicles, the cycles allowed for some testing in each functional mode. Actual test hours are recorded in Table 1.2-1. Additional PQT-G (testing) on some work sections, after OT, may be necessary to satisfy all original test plan requirements.

#### 1.4.2.1 Test Schedule

Appendix E contains the test schedule.

#### 1.4.2.2 Test Location

The PQT was conducted at Fort Belvoir, Virginia; the majority of the test was performed at the MERADCOM Test Area (see Figure 2.1-1, map). Suitable post projects within Fort Belvoir were undertaken when the project provided the type of task called out in the mission profile of this test plan and allowed adequate test control.

#### 1.4.3 Inspection

A receiving and initial inspection was performed on each test item and the material contained in the MTSP including manuals and spares. The receiving inspection was performed for the purpose of determining the test item's condition as a result of transportation from the contractor's plant. The initial inspection included the inventory of items shipped and a visual inspection for damage according to the applicable technical manuals. Incidents were noted, then adjusted or corrected as required. Fluid levels were checked; further servicing was not done unless service was scheduled according to the lubrication order and applicable technical manuals. Samples of lubricants and fluids were removed from the test items. The test item was started and all controls were operated briefly as a functional inspection. At the time the test was suspended, a final inspection was also performed. Repairs were made as required to restore test items to serviceable condition or were deferred to the next scheduled maintenance service. Inspections were performed according to the inspection checklists and the applicable technical manuals. Repairs were reported by EPR and MTL.

#### 1.4.4 Break-in

When received at MERADCOM, the test items had accumulated varying amounts of hours (Table 1.2-1) as a result of the contractor's RDAT. Low-time test items (less than 20 hours on hourmeter) were operated and adjustments made

according to the technical manual for the duration of the break-in period. Operational time accumulated through prior contractor testing was chargeable against the initial 20 hours.

### 1.4.5 Reliability

MTBF and reliability estimates are developed from the collected data base which was formally processed through the scoring conference process. The failure scoring criteria and detail of the mission failure definition appear as Appendix XV of the PQT-G Detail Test Plan.

#### 1.4.6 Subtests

The subtests were designed to test individual vehicle characteristics against the test objectives. Many subtests were similar in nature; however, some of the subtests were unique to a particular vehicle, as detailed in the appropriate section of the test report.

### 1.4.6.1 Safety

A test item safety statement based on contractor testing was provided by the PM to MERADCOM. Vehicle manuals were checked to determine if the safety precautions and guidance were adequate. Normal safety precautions were taken and Command safety policy was followed during testing. Safety-related problems involving the test items were reported in detail by EPR. The results of contractor noise level tests were reviewed; since noise levels exceeded acceptable limits, personnel were provided with ear protection. Testing was conducted regardless of weather conditions unless equipment and personnel safety were involved. MERADCOM Safety Office furnished TECOM with recommendations for an OT safety release prior to the start of OT. The recommendations supplemented the contractor's safety statement with analysis of the PQT-G data.

#### 1.4.6.2 Environmental Impact

As anticipated, the environmental impact of the FAMECE test program was not significant. The FAMECE vehicles had no more impact on the environment than any other standard military construction vehicles. Noise-pollution levels beyond the operator's station were not significant. Exhaust smoke densities were not visible. Test sites remained virtually unchanged because there was no necessity to uproot trees. All soil removed throughout the test was replaced and the terrain was restored.

## 1.4.6.3 Fuel Consumption

The amount of fuel consumed and the rate of fuel use were recorded for each power section. This information is provided in paragraph 2.5, ENDURANCE (POT-G) TESTING.

## 1.4.6.4 Human Factors Evaluation

Each vehicle was examined to determine the availability of the operator to gain access and egress and to perform vehicle operations.

## 1.4.6.5 Maintenance Evaluation

Maintainability indexes were calculated, special tools and TMDE requirements were investigated, and equipment publications were evaluated.

# 1.4.6.6 Reliability and Durability

Point estimates of mission and system mean-time-between-failures (MTBF) were calculated.

## 1.4.6.7 Inspection

At the time of test suspension, inspection was performed on each FAMECE section prior to shipment to the OT test site.

## 1.4.7 Training Program

A training program was developed to familiarize MOSqualified Military and DA civilian personnel in the unique operating characteristics of FAMECE vehicles, maintenance functions of operators and crews, and higher maintenance operations peculiar to FAMECE systems.

A 9-day course covering organizational, direct-support, and general-support maintenance was held at the contractor's facility in July 1977. A 5-day operator course was also held there during the same month. Additional training was conducted by MERADCOM at Fort Belvoir by New Equipment Training (NET) personnel. Instruction was in accordance with the Summary of Instructions contained in the Test Plan.

### 2. DETAILS OF TEST

#### 2.1 INTRODUCTION

The PQT was essentially an endurance test with the objective to obtain the maximum number of vehicle test hours within the FAMECE development schedule commensurate with the recovery of valid test data for RAM-D evaluation. The test was suspended before the total planned test hours were accumulated. The endurance tests were conducted in 100-hour cycles. Testing within each cycle was done according to the task percentages specified in the MN mission profiles. Table 2.1-1 compares mission profiles and actual course negotiations.

Each vehicle was tested at the MERADCOM Annex on soil composed of sand-clay and gravel-clay. Figures 2.1-1 and 2.1-2 give the location and physical characteristics of the test course. Ordinarily, with moisture levels in an acceptable range, measurement of production rates is not a problem. The charted mean temperatures and rainfall during PQT-G, shown in Figure 2.1-3, support the fact that soil conditions were not ideal. High moisture content created loss of bearing strength, slope instability, and loss of shear in warm weather and poor traction (frozen surfaces) in freezing weather.

The following productivity tests requested by the U.S. Army Engineer School were not completed for the FAMECE at MERADCOM during the PQT-G because of the weather and soil conditions. Tests involving slopes were not attempted because of unstable soil conditions.

The following tests were not completed:

Production Tests - Units of work/time.

Loader - Stockpiling and earthmoving.

Dozer - Earthmoving; stockpiling; push-loading.

Scraper - Earthmoving; handling.

Dumper - Earthmoving; human factors. Subjective evaluation was not done because of scheduling problems.

Grader - Road maintenance; high-bank sloping.

S.D. Compactor - Embankment compaction; asphalt transportability.

T.F. Compactor - Embankment compaction.

Transportability - Cross-country on a trailer; marine transportability.

S.D. and T.F. Compactors - Pneumatic mode of compaction was tested on frozen or partially thawed soil. Soil conditions were not adequate for testing in the vibratory mode.

Because PQT-G testing was halted to prepare for OT II, highway and marine transportability testing was modified or other data substituted in lieu of performing the planned tests.

Productivity and vehicle stability on slopes were tested and reported in the contractor's RDAT/EDT.

Concurrent with MERADCOM testing, CEC performed similar endurance testing of Grader (Serial 471X102), Dozer (Serial 466X102), and Scraper (Serial 464X101). Each work section and associated power section was tested for approximately 400 hours; incidents and maintenance actions were reported by CEC using their FFR format and the MERADCOM MTL. The resulting CEC data are recorded separately from MERADCOM data.

Table 2.1-1. Test Course Negotiated or Worked (Mission Profile Versus Actual)

Test Hours Completed During PQT-G	237	293	830	743	1047	776	936	223
Miscellaneous			10	2 2		10	2 2	2 2
Travel	10	10	35	10	15	10	10	10
Distributing			55					
Vib. Mode Compact.	20							
Asphalt Compact.	10							7
Base Course Compact.*	30	06						
Embankment Compact.*	30	30						
Ditching						10		
Spreading & Leveling						20		
Road Maintenance						55		
gnilusH								
gniwoT				5 5	30			20
Push-Loading				5	5 5			
Stockpiling				15			20	
Earthmoving				60 15 60 16	50		65	80
Percent of Task- Mission Profile Versus Actual	Mission Profile Actual	Mission Profile Actual	Mission Profile Actual	Mission Profile Actual	Mission Profile Actual	Mission Profile Actual	Mission Profile Actual	Mission Profile Actual
Percent Mission Versus	Mission Actual	Mission Actual	Mission Actual	Mission Actual	Mission Actual	Mission Actual	Mission Actual	Mission Actual
Test Item	Compactor (SD) PS T953 WS T954	Compactor (TF) PS T951 WS T952	Distributor I PS T941 WS T938	Dozer I PS T943 WS T944	Dumper I PS T935 WS T936	Grader I PS T939 WS T940	Loader PS T937 WS T966	Scraper I PS T955 WS T956

\*Pneumatic mode only

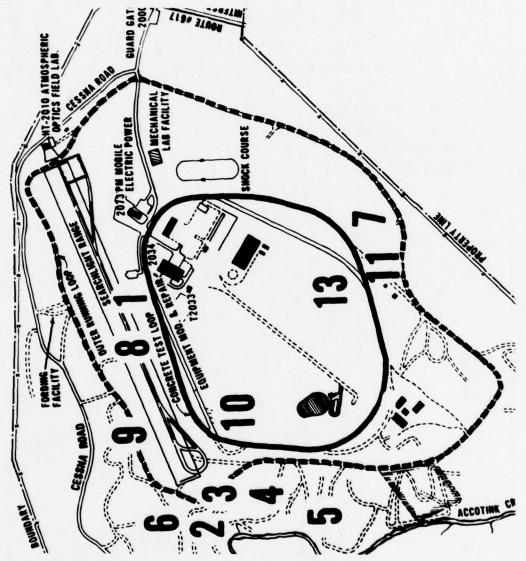


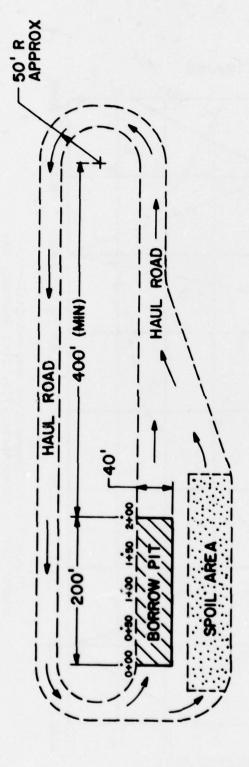
Figure 2.1-1. Test course negotiated/worked by FAMECE (MERADCOM Annex, North Area; Fort Belvoir, VA).

Notes	Travel	Travel	Compaction	Travel	Compaction	Travel, Loaded/Empty	Travel, Loaded/Empty	Distributing Water	Distributing Water	Stockpiling	Earthmoving (Dozing)	Pushloading/Stockpiling/ Towing	Travel	Hauling Materials/Cargo	Earthmoving (Hauling)	Towing	Travel
Soil	Concrete	Clay/Gravel/Rock	Clay/Gravel	Clay/Gravel	Clay/Gravel	Concrete	Clay/Gravel/Rock	Clay/Gravel	Clay/Gravel	Clay/Gravel	Clay/Gravel	Clay/Gravel	See Distributor	Clay/Gravel	Clay/Gravel	Clay/Gravel	See Distributor
Terrain	Flat/to 50% Grade	Hilly/to 50% Grade	Flat	Flat/to 18% Grade	Flat	Flat/to 50% Grade	Hilly/Rocky/Rough/ to 27% Grade	Flat/to 18% Grade	Flat	Hilly/to 36% Grade	Flat	Flat	1,3,9 See Distributor	Hilly/to 36% Grade	Hilly/to 17% Grade	Flat	1,3,9 See Distributor
Area	1	6	7	6	13	1	9	6	13	2	7	13	1,3,9	7	9,6	13	1,3,9
Test Item	Compactors					Distributor				Dozer				Dumper			

Figure 2.1-1. Test course negotiated/worked by FAMECE (MERADCOM Annex, North Area; Fort Belvoir, VA) (Continued).

Notes	Stockpiling	Earthmoving	Earthmoving Stockpiling Travel	Road Maintenance	Spreading/Leveling/Ditching	Road Maintenance	Travel	Travel	Travel	Travel	Earthmoving (Scraping)
Soi1	Clay/Gravel	Clay/Gravel	Clay/Gravel Clay/Gravel See Distributor	Clay/Gravel	Clay/Gravel	Clay/Gravel	See Distributor	Concrete	Clay/Gravel/Rock	Clay/Gravel	Clay/Gravel
Terrain	Hilly/to 36% Grade	Hilly/to 17% Grade	Flat Flat See Distributor	Flat	Flat	Flat	1,3,9 See Distributor	Flat/to 50% Grade	Hilly/Rocky/Rough/ to 27% Grade	Flat/to 18% Grade	Flat
Area	2	5,6	7 13 1,3,9	∞	10	11	1,3,9	1	e	6	13
Test Item	Grader			Loader				Scraper			

Figure 2.1-1. Test course negotiated/worked by FAMECE (MERADCOM Annex, North Area; Fort Belvoir, VA).



Test Procedure:

- Load in direction of advancing stations. Travel counterclockwise over haul road to spoil area.
- Spread over spoil area. Continue counterclockwise over haul road (empty) to borrow pit. Load and repeat cycle. Cycle length  $\sim$  1500 feet approximately (  $\sim$  500 m).

Scraper in push loading mode 50% and self-loading 30%. Note:

Scraper test course. Figure 2.1-2.

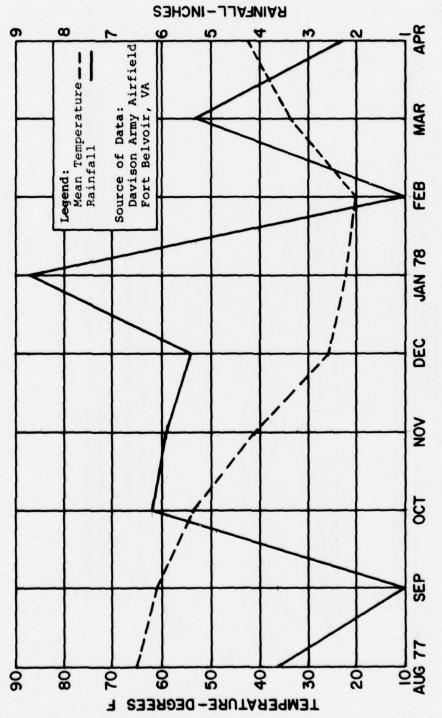


Figure 2.1-3. Temperature and rainfall — August 1977 through April 1978, Fort Belvoir, VA.

#### 2.2 INITIAL INSPECTION

## 2.2.1 Objectives

- a. To determine whether the Maintenance Test Support Package (MTSP) is complete.
- b. To ensure that the power sections and work sections are in good operating condition and are reasonably safe for further tests.
  - c. To identify the fuel and lubricants used.
- d. To determine the completeness of the OEM and adequacy of provision for stowage.

## 2.2.2 Criteria

- a. It is essential that FAMECE operate using standard Army fuels and lubricants [MN (ED) (QMR), para 9.a.(1)].
- b. It is essential that waterproof and dustproof storage be provided on each power section and work section for maintenance logs, manuals, and other instructional material [MN (ED) (QMR), para 9.a.(12)].

## 2.2.3 Method

The MTSP provided with each vehicle was examined to determine completeness with respect to manuals; repair parts; and tools, special tools, and TMDE. A record was made of the items included in the MTSP and compared with the listing (DD Form 250) furnished by PM FAMECE. Shortages in the inventory were noted and reported to the material developer.

The checklists provided in the Operator's and Organizational Maintenance Manuals for individual equipment, in addition to the detailed inspection checklists provided in PQT-G detail test plan, were used for the initial inspection.

Specific areas of inspection for each test item included:

a. Stowage--the maintenance log, manuals, and other instructions were stowed in locations specified in the instruction manuals. The adequacy of stowage facilities was measured against the essential requirements for waterproof, dustproof, and free draining areas and for noninterference of stowage items or facilities with proper functioning of catches and release devices.

- b. Engine operation and fuel--engine was started to ensure that it was operational and would operate using standard Army fuels and lubricants.
- c. Fluids sampled and analyzed--to verify the usage of military lubricants and coolants.

## 2.2.4 Results

Detailed results of the initial inspection of each test item are given in Tables 2.2-1 through 2.2-10. As shown in the tables, the correction of certain deficiencies was deferred until repair became necessary, parts were available, or until after testing. Corrections were reported by EPR and MTL.

The toolbox provided on the power section was adequate for the OEM tools issued for operator level maintenance. Likewise, the canvas containers for logbooks and lube orders were satisfactory, although the location on the immediate front of the power section (next to the radiator grille) is vulnerable to brush.

The MTSP observed during initial inspection was incomplete because no parts list was available to check against the DD Form 250, Material Inspection and Receiving Report, and no list of special tools was available (see paragraph 2.8, MAINTENANCE ANALYSIS).

### 2.2.5 Analysis

- a. A MTSP list was not received prior to or during the test. Missing MTSP elements caused some delay of subsequent testing because of lack of repair parts.
- b. Test items received from the contractor were in good operating condition and ready for test with respect to the comments of Tables 2.2-1 through 2.2-10.
- c. The equipment operates using standard Army fuels and lubricants.
- d. Adequate provision has been made for storage of maintenance logs, manuals, and other instructions.

Initial Inspection of FAMECE Compactor (TF) Table 2.2-1.

108.9 86.9 Eng Hr Accum Hr Power Sec -T951 Work Sec -T952

Problem	Chafing	Piece of outer layer missing	Did not register correctly	Bent and painted over	Peeling	Out of alignment	Upper left part dented slightly	Right side wobbled	Does not ride in detent	Bent
Component	Hydraulic hoses	Hydraulic hose	RPM gauge	Hood handle	Warning decals	Tailgate lock/unlock manual control	Ballast bucket	Dolly wheel	Neutral lever	Disconnect-rod end support
Ref No.	1	2	3	4	Ŋ	9	7	80	6	10

1

Items installed after initial inspection:
 Windshield and wiper assembly.

ROPS.

• Cab support structure. • Cab canvas cover. • Rearview side mirrors (2).

Table 2.2-2. Initial Inspection of FAMECE Compactor (SD)

62.0 Eng Hr Accum Hr Power Sec -T953 Work Sec -T954

Problem	Out of adjustment	Groove around entire circumference (1/2" $\psi \propto 1/8$ " D)	Cutting hydraulic lines	Missing	Broken	Missing	Missing	Will not remain in detent	Oil leakage
Component	Drum scrapers	Tire, left rear	Engine access cover	Lock pin, hydraulic cover clamp	U-clamp, water tank tubing	Bolt, spool valve	Hood handle, right	Neutral lever	Miscellaneous
Ref No.	1	2	3	4	5	9	7	∞	6

Items installed after initial inspection:

• Windshield and wiper assembly.

- ROPS.

- Cab support structure. Cab canvas cover. Rearview side morrors (2).

Initial Inspection of FAMECE Distributor Table 2.2-3.

65.9 Eng Hr Accum Hr Power Sec -T941 Work Sec -T938

Problem	Function and destination of two wires unknown	Out	Oil seepage	Cut, 3/8" long	Painted over	Screens missing	Not registering properly, and contained condensation
Component	Wiring	Taillight, rear, curb	Miscellaneous	Battery cable	Air cleaner indicator	Power cluster breather	Tachometer
Ref No.	1	2	8	7	5	9	7

Items installed after initial inspection:

Windshield and wiper assembly.ROPS.

• Cab support structure. • Cab canvas cover. • Rearview side mirrors (2).

Table 2.2-4. Initial Inspection of FAMECE Dozer

78.2 Eng Hr Accum Hr Power Sec -T943 Work Sec -T944

Ref No.	Component	Problem
1	Miscellaneous	0il seepage
2	Tires	Overinflated

Items installed after initial inspection:
• Windshield and wiper assembly.

ROPS.

• Cab support structure. • Cab canvas cover. • Rearview side mirrors (2).

Table 2.2-5. Initial Inspection of FAMECE Dumper

è

25.4 Eng Hr Accum Hr Power Sec -T959 Work Sec -T960

Problem	Dented and painted over	Minor leak in vicinity of speedometer generator	Abrasion marks from contacting hood stiffener	Missing; had been replaced by a petcock valve
Component	Covers in vicinity of dolly wheel axles	Transmission	Muffler	Automatic relief valve on Power Section
Ref No.	1	7	e	4

Items installed after initial inspection:

• Windshield and wiper assembly.

ROPS.

• Cab support. • Cab canvas cover. • Rearview side mirrors (2).

Table 2.2-6. Initial Inspection of FAMECE Dumper

Eng Hr 19.6 Accum Hr 14.1 Power Sec -T935 Work Sec -T936

Ref No.	Component	Problem
1	Hood locking mechanism	Sprung
2	Valve cover gasket	Leaking oil
8	Valve cover	Pin hole
4	Windshield wiper controls	Lettering coming off
5	Dolly wheels	Drifting
9	Dolly wheel chain	Broken

Items installed after initial inspection:

• Windshield and wiper assembly.

- ROPS.
- Cab support structure.
- Rearview side mirrors (2).

Table 2.2-7. Initial Inspection of FAMECE Grader

Eng Hr 272.4 Accum Hr 119.5 Power Sec -T939 Work Sec -T940

Ref No.	Component Grader circle reverse	Problem Scored slightly
2	ring gear Grader blade	Minor dents
3	Radiator cooling fins	Dented slightly
7	Wing nuts (3)	Bent (used to mount the grader hydraulic control package to the cockpit of the power unit)
5	Air pressure gauge	On power section remained marginally in red
9	Hydraulic tank	Low on fluid; viewport backplate missing
7	Bypass valve	No instructional nameplate
8	Power cluster	Screen missing; filter clogged

Items installed after initial inspection:
 Windshield and wiper assembly.
 ROPS.

Cab support structure.Cab canvas cover.Rearview side mirrors (2).

Table 2.2-8. Initial Inspection of FAMECE Loader

Eng Hr 156.4 Accum Hr 13.3 \*Previously used with distributor \*Power Sec -T938 Work Sec -T966

Problem	Out of adjustment	Oil leakage and seepage	Damaged slightly	Dirt and grit lodged in mechanism; coupling difficult	Chafed	Screen missing; filter clogged	Underinflated	2-1/2 inch above full mark
Component	Wheel service brake, front right	Miscellaneous	Landing jack	Coupling device	Hydraulic lines	Power cluster filter	Tires	Transmission fluid level
Ref No.	1	2	3	4	5	9	7	80

Items installed after initial inspection:
• Windshield and wiper assembly.
• ROPS.

Cab support structure.Cab canvas cover.Rearview side mirrors (2).

Table 2.2-9. Initial Inspection of FAMECE Scraper

Eng Hr 28.0 Accum Hr 19.5 Power Sec -T955 Work Sec -T956

Problem	Oil leak	Will not rest in detents	Hole distorted	Oil leaks	Chafing of hoses at manifold	Underinflated	Missing hardware (in vicinity of of parking brake control
Component	Steering valve assembly	Transmission control lever	Anchor lock pin hole	Miscellaneous	Hydraulic hoses (metal covered)	Tire, left rear	Electric cable clamp on steering valve assembly
Ref No.	1	2	3	4	5	9	7

Items installed after initial inspection:

Windshield and wiper assembly.
ROPS.
Cab support structure.
Cab canvas cover.
Rearview side mirrors (2).

Initial Inspection of FAMECE Distributor Table 2.2-10.

Eng Hr 10.3 Accum Hr Power Sec -1957 Work Sec -1958

Ref No.	Component	Problem
1	Spray nozzle air valve	Air leak at flange of left rear valve
2	Nonskid material	Peeling from cab floor, fender, and hydraulic tank
m	Hydraulic line inside tank	Outer layer of hose cut by edge of opening in baffle
7	Coolant surge tank sight glass	Painted over
5	Coupler unlock	Push-pull knob missing
9	Logbooks	Inserts and log sheets missing
7	Miscellaneous fittings	Leaking
œ	Wheelwell access cover (left front)	Sharp corner not rounded off and panel butts against hydraulic line
on	Hydraulic line elbow fittings	Bolt lengths insufficient
10	Speedometer generator	Minor leak
11	Brake line to Work Section	Line to master cylinder butts against tank

Items installed after initial inspection:

• Windshield and wiper assembly.

· Cab support structure. · ROPS.

• Cab canvas cover.

1

### 2.3 TRANSPORTABILITY

# 2.3.1 Rail Transportability

## 2.3.1.1 Objective

The objective of the railcar transportability tests was to determine whether the FAMECE vehicles can be transported by rail and:

- a. To determine the adequacy of the vehicle tiedown points.
- b. To determine unusual requirements or problems associated with transporting FAMECE by rail.
- c. To determine whether FAMECE can be transported by rail without sustaining structural or mechanical damage.

## 2.3.1.2 Criteria

- a. It is essential that FAMECE be designed to permit worldwide movement by rail with no/or a minimum of disassembly [MN (ED) (QMR), paragraph 9.a.(15)].
- b. It is essential that FAMECE tiedown devices for rail be designed to withstand accompanying shock and vibration environments [MN (ED) (QMR), paragraph 10.g].

## 2.3.1.3. Method

Each FAMECE vehicle was placed on a rail flatcar and positioned longitudinally and laterally to obtain the most favorable tiedown angles with respect to vehicle tiedown points and railcar stake pockets. The ROPS, cab, and windshield were removed from the power section; the windshield was secured to the hood of the power section using the tie points provided.

The railcar used in the test weighed 51,200 pounds. Individual FAMECE vehicle weights varied from 24,000 to 29,600 pounds.

FAMECE technical manuals were checked for blocking and tiedown instructions; none was found.

Approved Association of American Railroad (AAR) tiedown procedures for wheeled construction equipment were followed with one significant exception. The most recent AAR procedures specify that for rubber-tired wheeled vehicles, primary tiedowns must be wire rope tightened with turnbuckles. However, to reduce tiedown installation time during the multiple test series, and with Transportation Engineering Agency (TEA) concurrence , chains and loadbinders were used instead for the dumper, distributor, scraper, grader, and S.D. compactor. These vehicles were tied down by four 16foot lengths of 3/8-inch steel chain with a breaking strength of 11,500 pounds. The chains were run through clevises placed on each vehicle tiedown used (two in front, two in back) and through stakepockets on the flatcar; the chains were tightened with loadbinders. On the remaining vehicles, rope with a breaking strength of 33,000 pounds was used. Turnbuckles were used to tighten the wire rope according to AAR procedures. Individual vehicle tiedown patterns and the wheel blocking pattern are illustrated in Figures 2.3-1 through 2.3-11.

Blocking of vehicle wheels was in accordance with approved AAR procedures including nailing of blocks to the railcar floor. Because of the width of the tires, three blocks were placed against the road surface both fore and aft of each wheel. Wheels of the compactor section were blocked on each of the four pairs of wheels at the most accessible points. Lateral movement was prevented in all cases, with a block centered against the outside of each tire. Block dimensions and position of wheel blocks are shown in Figure 2.3-1.

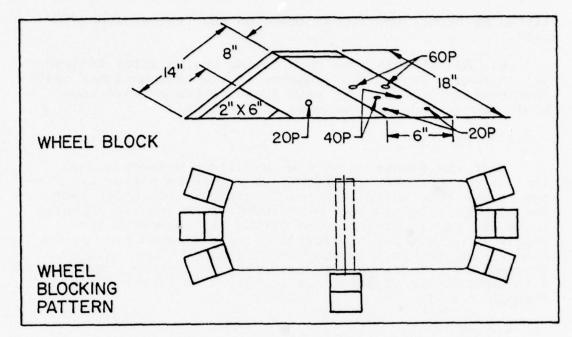


Figure 2.3-1. Wheel blocking pattern and wheel block.

Six accelerometers were placed on the vehicle frame near the pintle hooks on both sections to measure and record impact forces in the vertical, lateral, and horizontal directions. A photocell timer was used in determining the speed of the test vehicle and flatcar on impact.

A winch-driven dolly car was used to pull the flatcar up an inclined rail to predetermined heights which permitted the flatcar to attain the desired speed after release. The flatcar was then released and it rolled down the incline, reaching the specified speed before colliding with four impact cars. The impact cars were a gondola, boxcar, and two flatcars with a combined weight of 230,000 pounds. An examination of blocks and tiedowns and a visual inspection of the vehicles was performed after each impact.

The impact tests were performed in accordance with TOP 1-2-500 6.c with the following exceptions:

- a. The electric timer used to determine the approximate speed of the railcar at impact was placed alongside the tracks and approximately 10 feet before the point of impact rather than on the tracks and ahead of the point of impact.
- b. Because the impact car could not be reversed on the test track (for rear humping), each vehicle was untied,

lifted by crane, and repositioned on the railcar front-to-back.

c. Adjustments were made to the chains after individual impacts. It was the judgment of the test engineer that continuation of the tests with loose chains or wire rope would damage the test vehicles and be unsafe.

## 2.3.1.4 Results

With the exception of a weld failure between a fuel tank support bracket and frame, there was no noticeable damage to the test units as a result of the rail impact tests. The clevis failure on the distributor work section appeared to be the result of a missing cotter which secured the clevis pin. Without the cotter the pin slipped out of one side of the clevis, allowing it to expand. Each unit started and was driven away after the tests were completed. Detailed results of the tests are given in Figures 2.3-12 through 2.3-19.

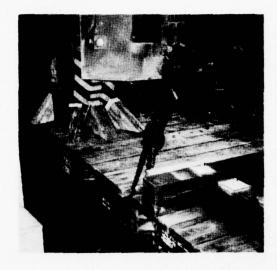
## 2.3.1.5 Analysis

The single incident that occurred during the rail impact test was the broken support bracket weld observed after the 8-mi/h test. Examination showed that the weld between the bracket and the frame was thoroughly rusted, indicating that the break had occurred before the test. A review of the test record revealed that this weld had, indeed, failed before and had been repaired; because of limited access, the tank was not removed and a strong weld was not made.

Subsequent endurance testing of each vehicle subjected to the impact test indicated no apparent related failures.

It is therefore concluded from this test that:

- a. While it was not the objective of this test to prove a tiedown system, the tiedown and blocking procedures used in the test are adequate; although the chain and wire rope used stretched and required retightening, indicating possible need for larger diameter wire rope. The grader was tested without retightening of the chain to determine if blocking would retain the vehicle. Blocking and tiedowns did retain the vehicle without subsequent damage.
- b. When blocked and tied down in the manner described, the FAMECE vehicles are capable of withstanding the hazards of rail shipment without damage.



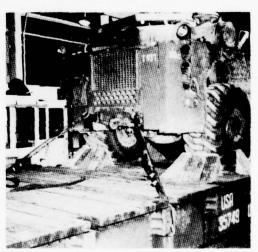
Typical power section tiedown with chains and loadbinder.



Typical power section tiedown with chains and loadbinders.

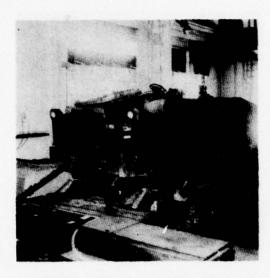


Loader tiedown with wire rope.

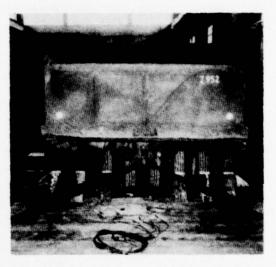


Power section tiedown with wire rope.

Figure 2.3-2. Vehicle tiedown.



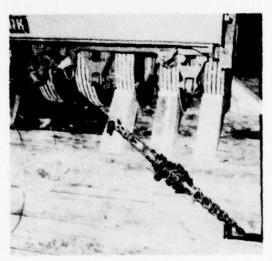
Typical power section tiedown and blocking.



Tiedown and blocking (T.F. Compactor).



Blocking detail (T.F. Compactor).



Blocking detail (T.F. Compactor).

Figure 2.3-3. Vehicle tiedown — T.F. Compactor.

TEST ITEM — Grader (T950, Serial 471X102) with Power Section (T949, Serial 446X116)

Vehicle Dimensions: 310 in. long, 103 in. wide, 97 in. high Wheelbase: 235 in.

Shipping Weight: 29,950 lb

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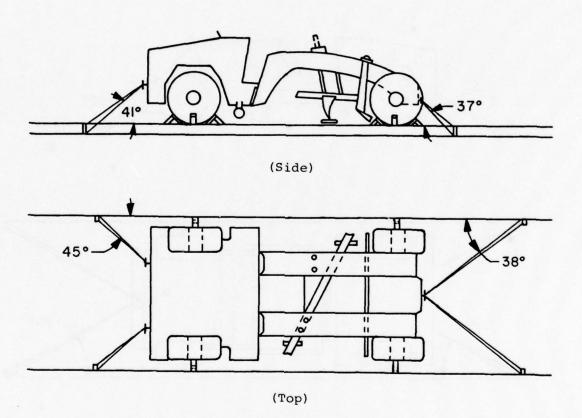


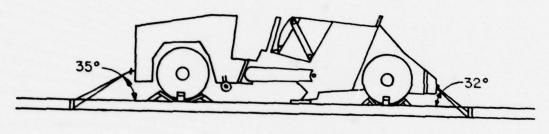
Figure 2.3-4. Vehicle tiedown — Grader.

TEST ITEM — Scraper (T956, Serial 464X102) with Power Section (T955, Serial 466X114)

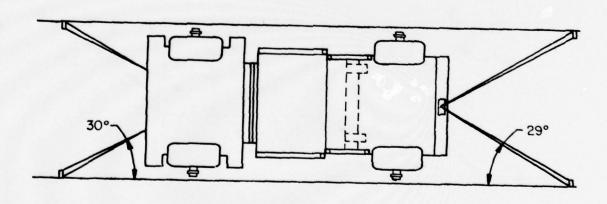
Vehicle Dimensions: 312 in. long, 105 in. wide, 97 in. high

Wheelbase:

Shipping Weight: 30,000 lb



(Side)



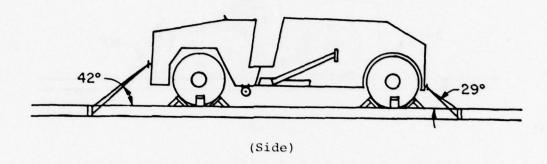
(Top)

Figure 2.3-5. Vehicle tiedown — Scraper.

TEST ITEM — Dumper (T960, Serial 467X104) with Power Section T959, Serial 446X113

Vehicle Dimensions: 276 in. long, 104 in. wide, 97 in. high Wheelbase: 182 in. Shipping Weight: 28,300 lb

X



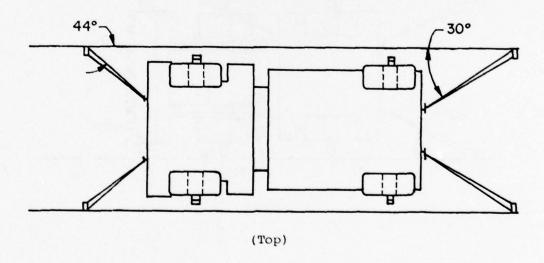
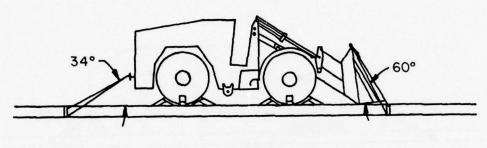


Figure 2.3-6. Vehicle tiedown - Dumper.

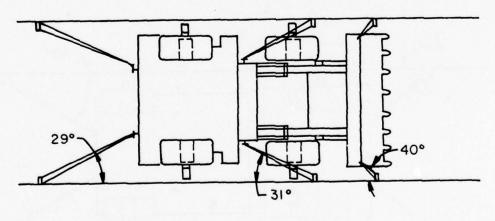
TEST ITEM — Loader (T966, Serial 465X102) with Power Section (T937, Serial 446X105)

Vehicle Dimensions: 262 in. long, 105 in. wide, 97 in. high 121 in.

29,500 lb Shipping Weight:



(Side)



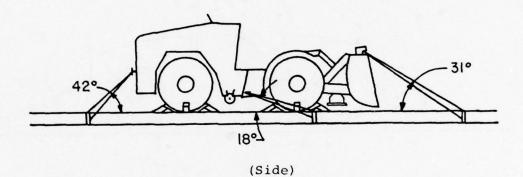
(Top)

Figure 2.3-7. Vehicle tiedown - Loader.

TEST ITEM — Dozer (T944, Serial 466X101) with Power Section (T943, Serial 446X107)

Vehicle Dimensions: 258 in. long, 105 in. wide, 97 in. high

Wheelbase: 112 in. 29,100 lb Shipping Weight:



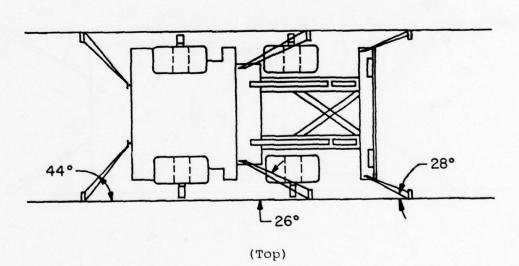


Figure 2.3-8. Vehicle tiedown - Dozer.

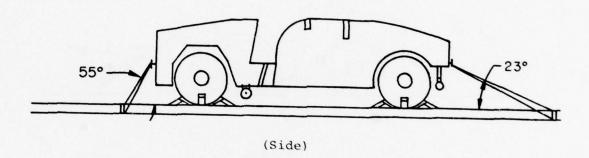
TEST ITEM — Distributor (T938, Serial 468X101) with Power Section (T941, Serial 446X106)

Vehicle Dimensions: 284 in. long, 104 in. wide, 97 in. high

Wheelbase:

182 in. 27,500 lb

Shipping Weight:



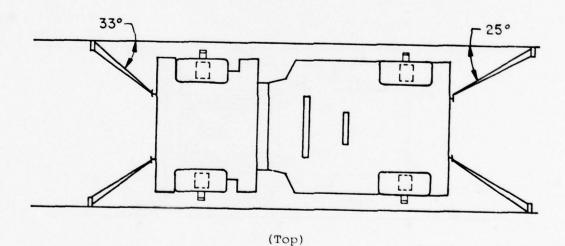


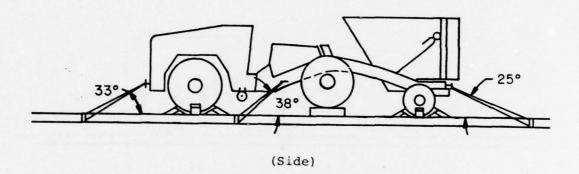
Figure 2.3-9. Vehicle tiedown — Distributor.

TEST ITEM — Smooth-Drum Compactor (T954, Serial 470X101) with Power Section (T953, Serial 446X112)

Vehicle Dimensions: 275 in. long, 105 in. wide,

97 in. high

Wheelbase: 186 in. Shipping Weight: 29,200 lb



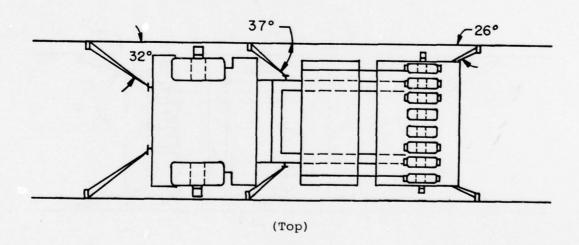


Figure 2.3-10. Vehicle tiedown — Smooth-Drum Compactor.

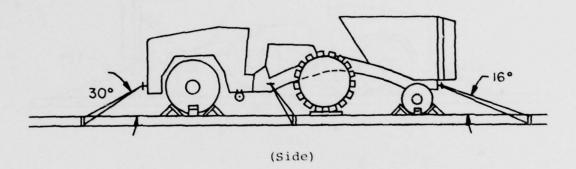
TEST ITEM — Tamping-Foot Compactor (T952, Serial 469X101) with Power Section (T951, Serial 446X110)

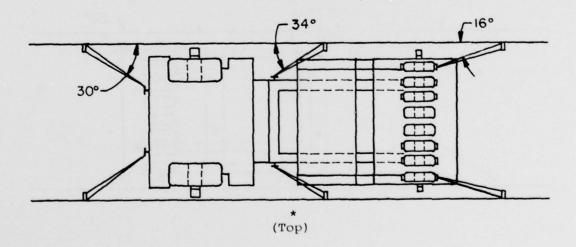
Vehicle Dimensions: 275 in. long, 105 in. wide, 97 in. high

Wheelbase:

29,900 lb Shipping Weight:

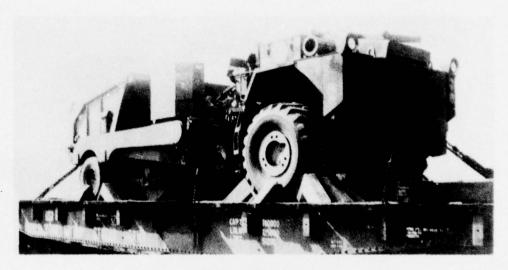
## TIEDOWN PATTERN





\*Chains added after first series of 4-, 6-, and 8-mi/h impacts.

Figure 2.3-11. / Vehicle tiedown - Tamping-Foot Compactor.



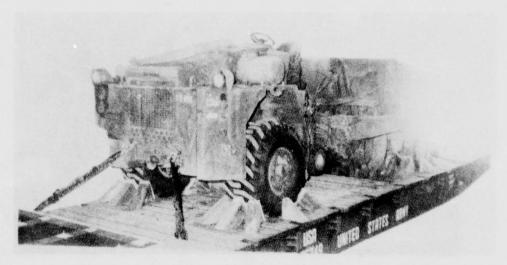
TEST 4,5,6

DIRECTION OF TRAVEL



Test No.	Impact Speed (mi/h)	Results	
		Power Module	Work Module
1	4.15		Chains loose
			(retightened).
2	5.59		Chains loose
			(retightened).
3	8.04		Chain elongated 2 links
			(retightened).
,	, ,,		
4	4.54	Chains loose (retightened).	
5	6.24	Chains loose (retightened).	
		(recignitened).	
6	8.41		Right side chain broken.

Figure 2.3-12. Smooth-Drum Compactor — rail transportability test results.



TEST DIRECTION TEST 4,5,6

Test	Impact		Results
No.	Speed (mi/h)	Power Module Work Module	
1	4.24		Left chain loose (retightened).
2	6.01		Both chains loose (retightened).
3	8.17	Right side wheel block sheared off (replaced).	Left chain broke (replaced).
NOTE:		f chains added at c 4, 5 and 6.	enter of roller prior to conducting
4	4.30		
5	6.05		Middle chain loose (retightened).
6	8.21		Chain elongated 1 link.

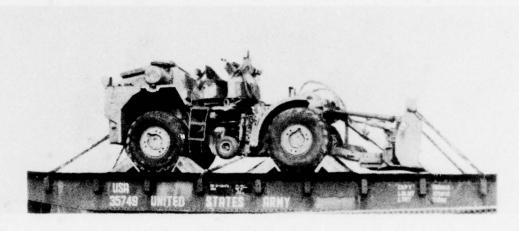
Figure 2.3-13. Tamping-Foot Compactor — rail transportability test results.



TEST DIRECTION TEST 4,5,6

Test No.	Impact Speed		Results
NO.	(mi/h)	Power Module	Work Module
1	4.00		Clevis on curbside failed. Clevis was replaced and test continued.
2	5.87		Chains loose (retightened).
3	8.11		Chain elongated, reached limit.
NOTE:	New chains	installed prior to	conducting tests 4, 5 and 6.
4	4.30		
5	6.02	Chains loose (retightened).	
6	8.11		

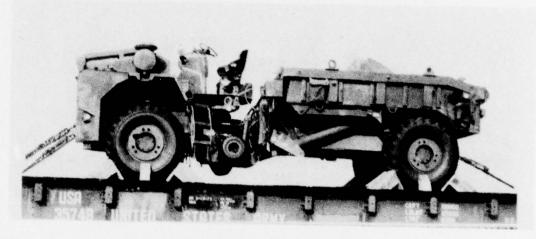
Figure 2.3-14. Distributor — rail transportability test results.



TEST 4,5,6 DIRECTION TEST 1,2,3

Test	Impact	F	Results
No.	Speed (mi/h)	Power Module	Work Module
1	3.95		
2	6.23		Wire ropes loose (retightened).
3	8.37		Wire ropes on middle section loose (retightened).
4	4.58		
5	6.33		Wire ropes loose (retightened).
6	8.54	Wire ropes elongated 2.5 inches.	

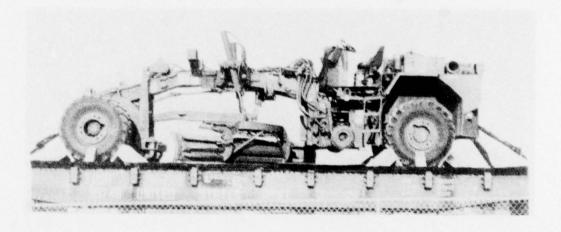
Figure 2.3-15. Dozer — rail transportability test results.



TEST DIRECTION TEST 1,2,3 OF TRAVEL 4,5,6

Test	Impact Speed (mi/h)		Results
No.		Power Module	Work Module
1	5.08		
2	5.57		Chains loose (retightened).
3	7.97	Hydraulic tank support bracket cracked.	Chains elongated 2 links (retightened).
4	4.10		
5	5.85	Chains elongated 1 link.	
6	7.69	Chains elongated 2 additional links.	

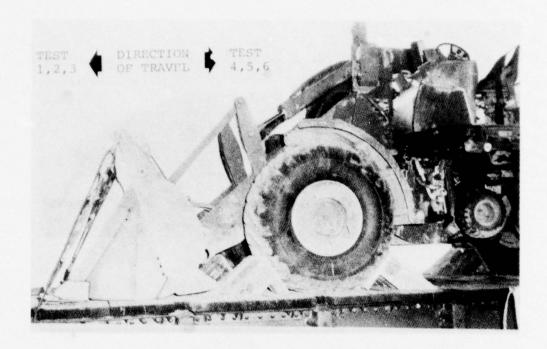
Figure 2.3-16. Dumper — rail transportability test results.



TEST 1,2,3 DIRECTION TEST 4,5,6

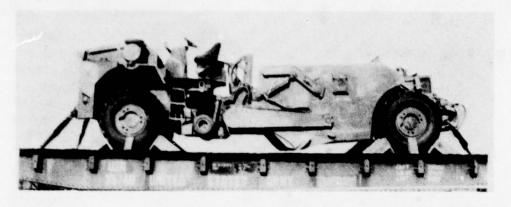
Test	Impact		Results
No.	Speed (mi/h)	Power Module	Work Module
1	4.27		
2	5.91		Small elongation on chains.
3	7.89	All chains elongated 2 inches.	All chains elongated 2 inches.
4	4.39		
5	6.13	Right side chain elongated 2 links.	
6	8.12	Right side chain elongated 1 more link.	

Figure 2.3-17. Grader — rail transportability test results.



Test No.	Impact Speed (mi/h)	Resu	ilts
		Power Module	Work Module
1	4.00		
2	6.30		Wire rope on left side loose (retightened).
3	8.31		roose (reeigneeneu).
	0.51	÷	
4	4.37		
5	6.26	Wire rope on left side loose (retightened).	Bucket moved 3/8 inch longitudinally.
		rouse (recigniteded).	longitudinally.
6	8.43		

Figure 2.3-18. Loader — rail transportability rest results.



TEST DIRECTION TEST 1,2,3 OF TRAVEL 4,5,6

Test No.	Impact Speed		Results
	(mi/h)	Power Module	Work Module
1	4.45		
2	6.17		Chains loose (retightened).
3	8.29		Chains elongated 2 links (retightened).
4	4.34		
5	6.04	Chains loose (retightened).	
6	8.17	Left side chain broken. Side wheel block sheared off.	

Figure 2.3-19. Scraper — rail transportability test results.

c. Minimal disassembly (i.e., removal of ROPS, fabric cab and mirror supporting structure, and windshield) and the installation of a steering link were required to prepare the vehicles for rail shipment.

# 2.3.2 Highway Transportability

### 2.3.2.1 Objective

To determine whether the test item can be transported over highways (TOP 1-2-500).

# 2.3.2.2 Criteria

FAMECE must be designed to permit worldwide movement by highway, rail, ocean, amphibious, and inland-waterway carriers with no/or a minimum of disassembly of equipment [MN (ED) (QMR), para 9.a(15), essential].

## 2.3.2.3 Method

Rather than simulating highway test conditions, existing data accumulated from highway movement between the contractor's plant and various test sites were used to determine compliance with the criteria. The PQT highway transportability test plan which referenced portions of TOP 1-2-500 was followed.

Thirteen FAMECE vehicles (power section with work section) and one work section alone were prepared for shipment at the contractor's plant (Benton Harbor, Michigan). The items were loaded on semitrailers and tied down with chains and binders as shown on the vehicle transportation data plates and/or in accordance with commercial and military practice. Figures 2.3-20 through 2.3-28 show the tiedown and blocking arrangements used. In normal preparation for shipment and to reduce height, the ROPS was removed, the fabric cab and tubular cab support stowed in the ROPS, and the windshield removed and secured to the engine hood. The steering link was installed to prevent articulation of the frame and, in the case of the dumper, the headache board was lowered into the dumper body. All load measurements and weights were recorded as shown in Table 2.3-1.

All vehicles were then transported on highways to MERADCOM (Fort Belvoir, Virginia) and later to Fort Bragg, North Carolina, for OT. In addition, several of the vehicles were transported to and from NARADCOM (Natick, Massachusetts). Interstate routes were followed primarily with remaining travel over at least surfaced roads within state

boundaries. The conditions permitted evaluation of turning characteristics, handling, and stopping ability of the transport with load. Instrumentation for measuring force levels was not installed since force levels created during the rail transportability test exceeded what would be encountered under highway emergency stopping conditions. On arrival at MERADCOM, all vehicles, blocking (when used), and tiedowns were inspected for evidence of load displacement and damage.

A limited number of recovery and towing operations were done as a result of disabling test accidents. Figures 2.3-29 and 2.3-30 illustrate such an incident. In this case, the dumper power section was being towed to the maintenance as a result of a damaged radiator. The operator's manual was consulted for appropriate towing procedures.

### 2.3.2.4 Results

Each FAMECE vehicle was shipped at least 941 miles (as shown in Table 2.3-2) by truck-semitrailer transport. The cumulative shipping distance was 18,656 miles over various roads and highway conditions. Inspection of the vehicles at MERADCOM revealed no apparent damage resulting from transport. Furthermore, 5,000 hours of subsequent PQ testing revealed no damage that might have been related.

Since the overall shipping width of each vehicle (103 to 105 inches) exceeded the limits of all states except Hawaii (see TOP 1-2-500, Table 5, page C-3), it was necessary to obtain permits restricting travel to specific times and road conditions. FAMECE vehicle weight or weight distribution was not a limiting factor. FAMECE technical manuals did not provide instructions for highway movement.

# 2.3.2.5 Analysis

The dumper vehicle was typical of several recovery operations which occurred during the test. Procedures described in the manual were followed and the vehicles could be towed without problem using the standard military heavyduty towbar, air, and electrical interconnections to the towing vehicle. Operators noted that it was difficult to back up a towed FAMECE vehicle because of the towed vehicle's articulated steering freedom.

Results of inspections and post-transport operations indicated that highway transport under a variety of climatic and highway conditions did not measurably degrade the performance of the FAMECE test vehicles. Because of poor soil

conditions, FAMECE vehicles were not transported by semitrailer over cross-country terrain as specified by the DTP.

The vehicle designs permitted reduction of height to within acceptable statutory limits and with a minimum of disassembly of equipment. Vehicle weights (gross) would not generally restrict highway transportability except when the vehicles carry loads. Available military and commercial truck-trailer combinations could handle all vehicles with regard to weight. Other design considerations, however, created a nonreducible vehicle width that exceeded limitations in all states through which the vehicles were actually transported. Further vehicle width reduction is not feasible at this time. A check of TOP 1-2-500 (Table 5.6 and Figure 6, Appendix C) shows that FAMECE exceeds vehicle width limits in all states (except Hawaii) and foreign countries. The effect of this condition is restricted freedom of road movement depending on local conditions. In this respect, the criteria are not met.

# 2.3.3 Marine Transportability

### 2.3.3.1 Objective

To determine whether the FAMECE can be transported by marine vessels.

### 2.3.3.2 Criteria

It is essential that the FAMECE:

- a. Be designed to permit worldwide movement by ocean carriers with no/or a minimum of disassembly of equipment [MN (ED) (QMR), paragraph 9.a.(15)].
- b. Be provided with lifting and tiedown devices for water shipment of individual sections as well as entire vehicles as required by MIL-STD-209B and AR 70-39 [MN (ED) (QMR), paragraph 10.g.].

## 2.3.3.3 Method

The PQT-G Test Plan specifies that the procedure given in the TOP 1-2-500 (7 Feb 73), Section II, paragraph 8.c.(1) be followed:

The test item is properly prepared for marine transport as prescribed in the appropriate technical manuals. To simulate dockside loading, the test item is lifted

off the ground by a mobile crane (or other suitable lifting device) to a height simulating ship deck height (up to 40 feet) and held for a period of 3 minutes... The load is rotated 90° to the extreme left, reversed 180° to the right, and reversed again 90° left to the original starting position. The test item is then lowered to within 4 inches of the ground and released to free fall the remainder of the distance to the ground. Once this has been accomplished, the test item is inspected for damage...

### 2.3.3.4 Results

This subtest was not conducted in the prescribed manner since PQT-G was terminated. However, information acquired from other subtests related to loading and transportability was analyzed.

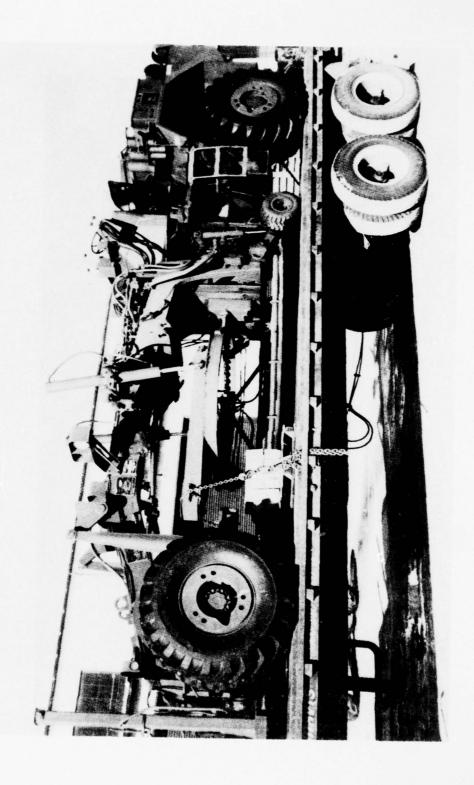
### 2.3.3.5 Analysis

Although not recorded as part of the rail impact test, each FAMECE, in its shipping configuration, was lifted, rotated, and placed on and removed from the rail car essentially in the manner described in the test plan for marine transportability. Two characteristics of the test item were measured:

- a. Strength capacity of the lifting attachments.
- b. Sling clearance.

No failures of lift attachments or problems with sling clearances were observed during the rail impact test. Subsequent endurance testing of each vehicle subjected to the rail impact test indicated no apparent related failures.

The FAMECE with lifting attachments, therefore, has successfully withstood forces similar to those that would have occurred during a formal test of marine transportability. Furthermore, it is believed that air transportability testing, including airdrop/helicopter lift duty cycle, is more rigorous than marine transportability testing with respect to the 4-inch free fall therefore demonstrating the ability of the test item to withstand both the shock and racking forces associated with the lifting and rotation and a 4-inch free fall. It is felt that successful completion of the air transportability testing would satisfy all marine transportability requirements.



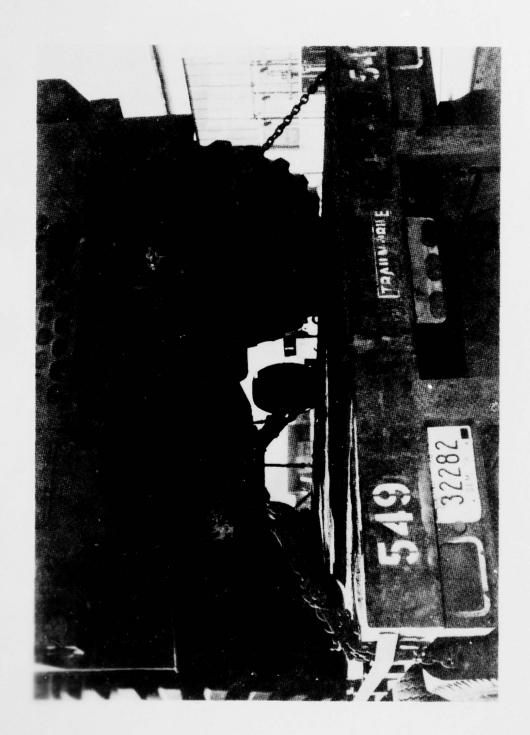
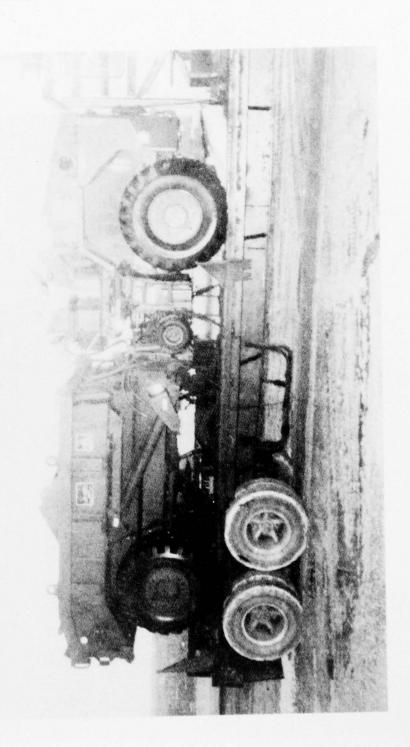


Figure 2.3-21. Grader - tiedown through power section pintle.



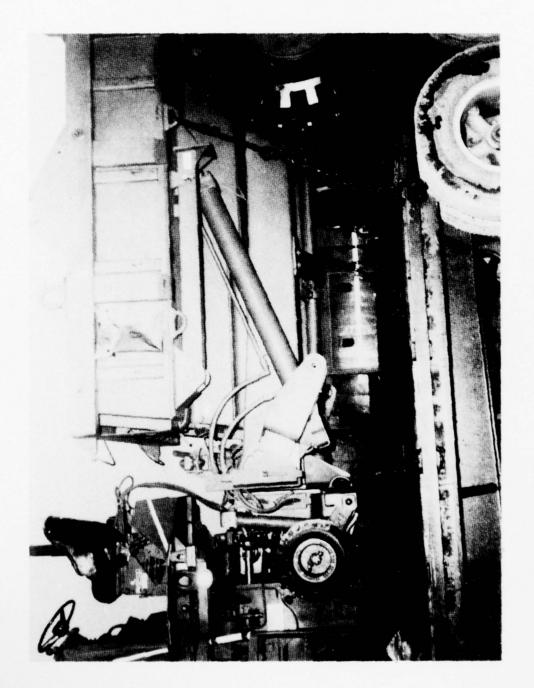


Figure 2.3-23. Dumper - tiedown of power section and work section.

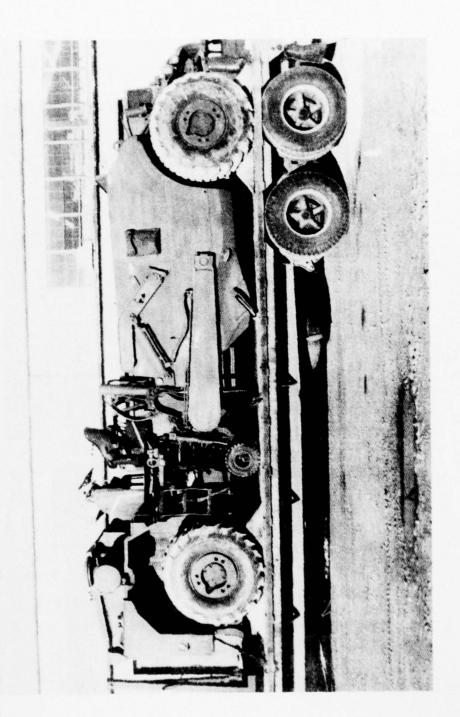




Figure 2.3-25. Scraper - work section rear tiedown.

Figure 2.3-26. Distributor.

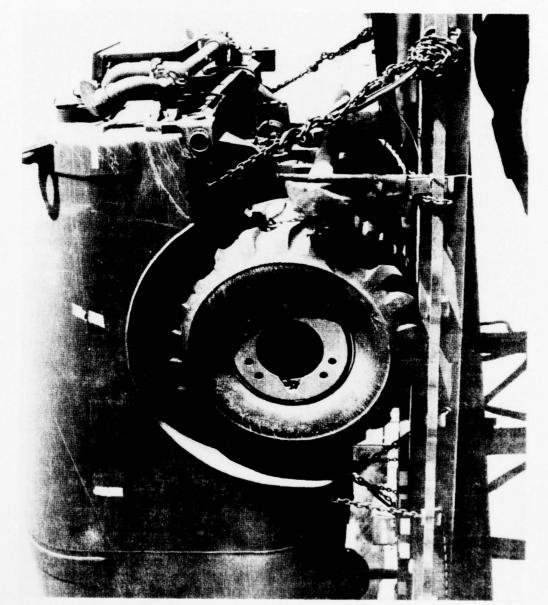


Figure 2.3-27. Distributor -- work section rear tiedown.

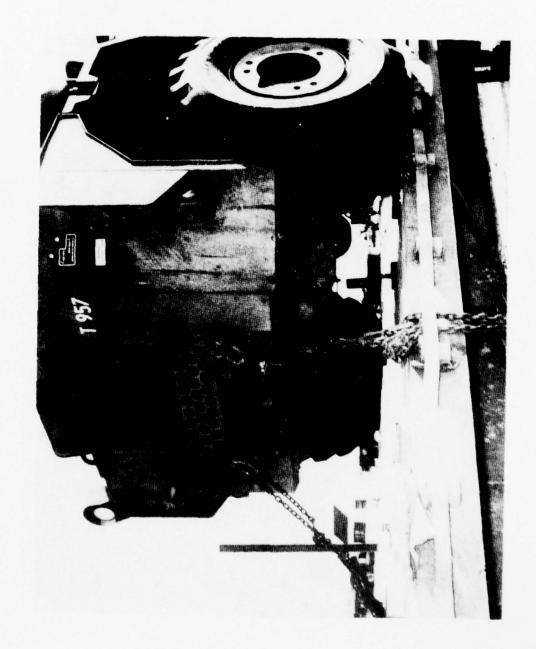


Figure 2.3-28. Distributor - power section front tiedown.



Figure 2.3-29. Dumper - recovery and towing operation, front view.

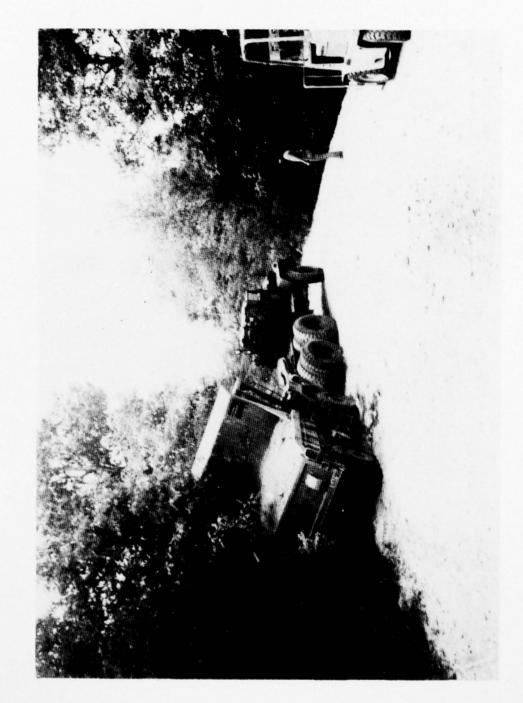


Figure 2.3-30. Dumper - recovery and towing operation, rear view.

Table 2.3-1. FAMECE Vehicle Data - Highway Transport

	Gross Vehicle Weight*	le Weight*	Vehicle Height	Vehicle	Vehicle
Vehicle	(Unloaded) (Loaded) (1b)	(Loaded) (1b)	(Reduced)	Length (in.)	Width (in.)
Power Section/Dozer	1	ı	76	258	105
Power Section/Loader	30,860	38,360	97	262	105
Power Section/Grader	30,700	30,700	86	309	104
Power Section/Scraper	31,140	61,140	97	l	105
Power Section/Dumper	29,980	50,980	76	1	103
Power Section/T.F. Compactor	30,960	30,960	76	١	105
Power Section/S.D. Compactor	1	1	76	274	105
Power Section/Distributor	29,100	49,850	97	286	103

\*Includes ROPS and cab frame; weight included fuel remaining in tank on arrival. No significant amount of soil was on vehicles.

Table 2.3-2. Highway Transport Record

					Highway	Highway Travel Route (Mi.)	e (Mi.)	
Work Section	Serial No.	Power Section	Serial No.	Benton Harbor, MI Ft. Belvoir, VA Watick, MA	Benton Harbor, MI Ft. Belvoir, VA	Ft. Belvoir, VA Natick, MA	Ft. Belvoir, VA Fort Bragg, NC	Potal Vehicle agasliM
Dozer (T946)	466X102	T945	466X109	910	*	493	307	1,710
Dozer (T944)	466X101	T943	466X107	*	634	*	307	941
Scraper (T956)	464X102	T955	466X114	*	634	*	307	941
Scraper	464X101	*	*	910	*	667	307	1,710
Distributor (T938)	468X101	T941	466X106	*	634	493/493	307	1,927
Distributor (T958)	468X102	T957	466X115	*	634	*	307	941
T.F. Compactor (T952)	469X101	T951	466X110	*	634	493/493	307	1,927
S.D. Compactor (T954)	470X101	T953	466X112	*	634	493/493	307	1,927
Grader (T940)	471X101	T949	466X104	×	634	493/493	307	1,927
Grader (T950)	471X102	T959	466X116	*	634	*	307	941
Loader (T966)	465X102	T937	466X105	*	634**	*	307	941
Dumper (T936)	467X102	T935	466X108	*	634	*	307	941
Dumper (T942)	467X103	T941	466X106	*	634	*	307	941
Dumper (T960)	467X104	T959	466X113	*	634	*	307	941
								18,656

\* Not routed to this location. \*\* Transported without power section.

## 2.4 PROTOTYPE QUALIFICATION TEST-CONTRACTOR (PQT-C)

# 2.4.1 Objective

The objective of contractor testing (PQT-C) was to evaluate the dozer, scraper, and grader by operating each vehicle for 400 hours. This testing was done concurrent with PQ testing at MERADCOM and is provided only as a summary without analysis.

## 2.4.2 Criteria

FAMECE was to meet all criteria specified in the test plan contained in Contract DAAE07-75-C-0051. The test plan was extracted from the PQT detail Test Plan dated 25 October 1977 which was prepared by MERADCOM.

## 2.4.3 Method

Each of the three vehicles was operated in accordance with the following mission profile:

### Dozer

Dozing	54%
Dozer winch operations	98
Pushloading	29%
Travel and miscellaneous	88

#### Scraper

Pushloading	26%
Self-loading	648
Travel and miscellaneous	10%

#### Grader

Road maintenance	40%
Sloping operations	35%
Spreading/leveling operations	15%
Travel and miscellaneous	10%

Both the dozer and scraper were tested to determine productivity (rate of moving soil). The dozer was used to construct a trench 3 feet deep, and the scraper removed soil to form a 110-foot-wide ditch.

A maintainability evaluation was performed on each vehicle whereby data resulting from any maintenance tasks were

recorded and analyzed, maintainability values were calculated, and a qualitative analysis was performed to determine general vehicle maintainability.

Data collected during testing of each vehicle were used to calculate MTBF and point estimates of reliability on both a system- and mission-failure basis.

Total consumption of fuel and fluids by each vehicle was determined and the data projected to a 10-hour work mission.

A human factors/safety evaluation was made of information related to operators' opinions of various vehicle characteristics.

Overall noise exposure was determined by recording sound levels with a dosimeter during various operations.

Total hours of operation were measured for the vehicles and a final inspection was performed at the conclusion of POT-C.

### 2.4.4 Results (CEC Report PQT-C 502)

The mission profiles for the dozer and scraper were altered slightly to accommodate overall testing and conditions of the test area. Freezing conditions occurred during approximately one-half of the PQT-C testing. The report indicated the following results:

- a. Productivity for the dozer and scraper tested was considered satisfactory.
- b. No major maintainability-related problems were identified during PQT-C; however, some minor problems or undesirable conditions were noted.
- c. Calculated MTBFs and vehicle reliability are shown in Table 2.4-1.
- d. Based on survey responses, the human factors/safety evaluation revealed no critical areas of concern. Military operators were used during PQT-C.
- e. Noise levels reached during operation, fuel and fluids consumption, and other test measurements appear in Table 2.4-2.

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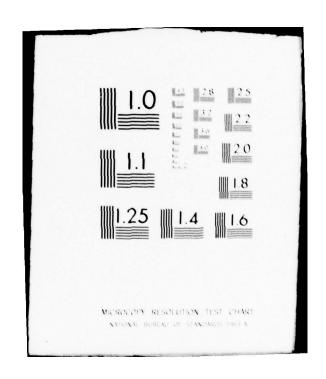


Table 2.4-1. MTBF/Reliability as Demonstrated — PQT-C (from CEC Report No. PQT-C 502)

		Fai:	lures	M	TBF	Relia	bility
Test It	em	System	Mission	System	Mission	System	Mission
Dozer	PS	10	1.00	40.4	400.0	77.9	97.5
	WS	4	2.75	100.0	145.5	90.5	93.4
	Veh	14	3.75	28.5	106.7	70.5	91.1
Scraper	PS	8	0	50.0		81.9	100.0
	WS	15	2	26.7	200.0	68.8	95.1
	Veh	23	2	17.4	200.0	56.3	95.1
Grader	PS	4	0	100.0		90.5	100.0
	WS	7	6	57.1	66.7	83.9	86.1
	Veh	11	6	36.4	66.7	76.0	86.1
Overal1	PS	22	1	54.5	1200.0	83.2	99.2
	WS	26	10.75	46.2	111.6	80.5	91.4
	Veh	48	11.75	25.0	102.1	67.0	90.7

PS = Power Section

WS = Work Section

Veh = Vehicle

Table 2.4-2. PQT-C Test Data

		Incidents	Incidents Fuel Consumption	Total A	Total Added During 10-Hour Service (gal)	10-Hour	Service	
Vehicle	PQT-C Hours	PQT-C Reported Hours (FFR's)	Test Average (gal/h)	Engine 011	Engine Hydraulic Trans. Oil Oil Fluid	Trans. Fluid	Coolant	Trans. Maximum Noise Fluid Coolant Exposure Level (dBA)
Dozer 446X102 with PS 446X109	700	39	4.82*	3.0	7	13.5	.50	96
Scraper 446X101 with PS 446X111	400	29	6.33**	10.5	22	8.0	3.75	86
Grader 471X102 with PS 446X116	400	22	4.82***	7.0	31	6.5	0	100

\* Based on 396.8 hours of testing.

\*\* Based on 398.6 hours of testing.

\*\*\* Based on 388.5 hours of testing.

### 2.5 ENDURANCE (PQT-G) TESTING

FAMECE was tested according to the mission profile given in Appendix II of the Detail Test Plan (DTP) and individual test plans of Appendices III through X of the DTP. All the data for safety, human factors, maintenance, reliability, and durability were generated during this test. Planned productivity checks could not be made because auverse weather and the resulting soil conditions prevented collection of reliable information. The endurance test phase of PQT-G simulated the FAMECE mission profile during repetitive test cycles designed for the specific work section being tested; however, delivery of the test items, availability of the items for test, and climatic conditions limited test hours actually attained. The tests were conducted in 100-hour cycles until suspended on 17 March 1978 in order to prepare the FAMECE for OT.

# 2.5.1 Objectives

- a. To determine the ability of the FAMECE to travel over designated road and cross-country test courses for a prescribed distance or time and perform the typical work functions required.
- b. To obtain data suitable for application to other subtests--reliability, maintenance evaluation, safety, and human factors analysis.

## 2.5.2 Criteria

(From Appendix 2, Items 2, 3, 4, and 7, of the Detail Test Plan.)

a. A typical mission profile for each member of the family will be composed of the following construction tasks in the percentages indicated below:

#### Dozer

Earthmoving (dozing)	60%
Stockpiling	15%
Pushloading	5%
Towing	5%
Travel	10%
Miscellaneous	5%

Loader	
Earthmoving (loading) Stockpiling Travel Miscellaneous	65% 20% 10% 5%
Scraper	
Earthmoving (scraping) Hauling (construction materials)	80% 5%
Travel Miscellaneous	10% 5%
Dumper	
Earthmoving (hauling) Hauling (construction materials & general	50%
cargo) Towing	30% 5%
Travel (to include transporting squad personnel & tools)	15%
Grader	
Road maintenance Spreading & leveling fill Ditching Travel Miscellaneous	50% 20% 10% 10% 10%
Compactors	
Embankment compaction Base course compaction Vibratory mode compaction Asphalt compaction Travel	30% 30% 20% 10% 10%
Distributor	
Distributing water Hauling water Travel	55% 35% 10%

b. (Essential) Must operate utilizing standard Army fuels and lubricants.

- c. (Essential) Must have sufficient fuel capacity for at least 200 miles of travel on secondary roads or 10 hours of operation as a work tool.
- d. (Essential) The power module and work module will be capable of being coupled or uncoupled at the work site within 30 minutes (15 minutes is desirable) without the need for special tools or equipment.

### 2.5.3 Method

Detailed test plans for each of the work sections are contained in Appendices III through X of the DTP. The endurance of PQ test, as part of DT II, is perceived as a means of demonstrating and validating the various criteria of the MN; however, the emphasis of the test was to demonstrate the reliability and maintainability characteristics of the FAMECE system. The detailed tests were designed using proven SAE and Army procurement specification test procedures applicable to the functional work section being tested. Throughout the endurance test, the test items were serviced and maintained in accordance with the appropriate lubrication charts and TM's provided with the equipment. record of incidents, malfunctions, and maintenance actions was logged and photographs were made of the more significant problems. During the tests, engine hourmeter readings were The lights and electrical circuits were checked during pre- and post-operational inspections. Only standard military lubricants and fuel, procured to Federal specifications, were used during the endurance test. The fuel used and oil added during operation were recorded. Road speeds were held to reasonable and practical speeds for the course The test items were examined visually at the conditions. start of, during, and at the end of the shift of operation to determine excessive wear, damage, failures, or impending failure. Coupling/uncoupling operations were performed in the field as required during maintenance and to investigate related incidents.

### 2.5.4 Results

Test results for FAMECE test items follow:

#### 2.5.4.1 Operating Time--Engine Hourmeter and Clock Hours

Engine hourmeter readings were recorded when the test items were received for PQT-G at MERADCOM and throughout the test. After PQT-G, hourmeter readings were recorded and the number of test hours or clock hours completed (the difference in readings) calculated for each item. The data appear in Table 1-1, FAMECE Test Data.

# 2.5.4.2 Fuel Consumption

The total amount of fuel consumed, the average rate of consumption for the respective mission profile, and significant problems observed for each vehicle during testing are shown in Table 2.5-1. All test items satisfied the MN requirement that there be sufficient fuel capacity for 10 hours of operation as a work tool.

## 2.5.4.3 Oil Consumption

The engine oil and lubricant consumption observed for each test item are shown in Table 2.5-2.

### 2.5.4.4 Coupling/Uncoupling Time, Minutes

Coupling and uncoupling times were obtained from two sources: 50-hour service records and special coupling/uncoupling test records.

The service record summary covering the period from August 1977 to March 1978, in Table 2.5-3, contains times for vehicles checked. The average operation (coupling or uncoupling) times exceeded the allowable 30 minutes for the dumper and distributor, and individual operation times exceeded 30 minutes 22 percent of the time. The majority of the uncoupling/coupling operations were performed in an unheated shop. Due to the wet or freezing weather during this time, it was necessary to thaw the coupling with water to remove frozen mud prior to uncoupling.

The special coupling/uncoupling tests were conducted on six vehicles during 23 February to 8 March 1978 in a gravel parking lot in temperatures from 18 to 45°F. Operators were experienced and trained, had performed the operations before, and were equally skilled. The time records summarized in Table 2.5-3 show the average times for five of the eight vehicles were under 30 minutes.

Table 2.5-4 compares operation times from the service records with the test times.

Table 2.5-1. FAMECE Fuel Consumption

	Referen	nce No.		Total Fuel	Con- sump-
Test Item	Power Section	Work Section	Total Engine Hours	Con- sumed (Ga1)	(Gal/ Hr)
Compactor (SD) See Note 2	Т953	Т954	256.6	938.0	3.65
Compactor (TF)	T951	T952	283.3	1160.0	4.09
Distributor	T941	Т938	466.0	4159.7	8.92
Distributor	T957	T958	227.8	897.7	3.94
Dozer	T943	Т944	738.0	2552.0	3.46
Dumper	Т935	Т936	1012.5	3814.0	3.76
Dumper	Т959	T960	355.4	1755.0	4.94
Dumper	Т935	Т942	204.5	786.5	3.84
Grader	Т939	Т940	771.8	2920.0	3.78
Grader	Т949	Т950	91.9	490.0	5.33
Loader	Т937	Т966	935.8	3355.4	3.58
Scraper	T955	Т966	216.2	1046.0	4.84

## Notes:

- Fuel tank capacity 70 gallons.
   Tested in pneumatic mode only over gravel test course.

Table 2.5-2. Oil and Other Lubricant Consumption

	Referen	Reference No.	Consun	Consumption (Gal)	a1)	00	Other	
Test Item	Power Section	Work	Engine Oil	Trans 0il	Hyd 011	Type	Qty	Notes
Compactor (SD)	T953	T954	12.00	0.50	2.25			
Compactor (TF)	T951	T952	15.50	2.50	12.00			
Distributor	T941	T938	36.00	39.00	21.75			
Distributor	T957	T958	4.25	13.00	23.50	06-09	2 Ga1	Replaced differential seal.
Dozer	T943	T944	31.75	28.25	5.50			
Dumper	T935	T936	33.75	23.00	51.00			
Dumper	T959	1960	12.50	4.00	26.50			
Dumper	T935	T942	12.50	2.00	1.00			
Grader	T939	T940	45.75	7.50	41.00	06-09	2.5 Gal	Added to right wheel
							1.0 Pt	Added to differential.
Grader	1949	T950	17.00	0	7.00	06-09	11.0 Qt 1.0 Pt	Brake fluid - brakes repaired/adjusted.
Loader	T937	T966	38.50	5.09	13.25		4.0 oz	Brake fluid
Scraper	T955	T956	10.00	1.00	34.00	34.00 60-90	2.0 Gal	Added to front differential.

Note: Engine oil changed every 250 engine hours.

Table 2.5-3. Coupling/Uncoupling Times; Service Period August 1977 to March 1978 (from 50-Hour Service Records)

Vehicle	Date		(Min) Uncouple	couple or Couple Operation Average (Min)
S.D. Compactor T954 Power Section T953	12/15/77 1/09/78	8 24	12 }	15.5
Scraper T956 Power Section T955	12/08/77 12/14/77 12/21/78 1/30/78 3/13/78 3/20/78	36 8 15 12 12	67* 15 15 20 12 15	19.75
Dozer T944 Power Section T943	10/13/77 10/25/77 11/03/77 11/14/77 11/15/77	N/A N/A 18 N/A N/A	12 12 12 24 12 12	1 7
Distributor T938 Power Section T941	12/02/77 10/21/77 11/01/77 11/14/77 11/22/77 12/02/77 12/15/77 12/21/77	N/A N/A N/A 30 N/A N/A N/A	20 } 23 18 75 36 16 16 55	33.7
Loader T966 Power Section T937	9/26/77 10/18/77 11/05/77 11/10/77 11/22/77 12/16/77 1/10/78 1/25/78	18 20 36 N/A 42 N/A 15 25	24 20 42 18 24 26 20 15	24.6
T.F. Compactor T952 Power Section T951	12/07/77 12/15/77 1/09/78 1/25/78	6 25 N/A 10	6 15 28 17	15.3

Table 2.5-3. (Continued)

Vehicle	Date	Time	(Min)	Uncouple or Couple Operation e Average (Min)
Dumper T936 Power Section T935	8/19/77 8/25/77 9/13/77 9/23/77 10/12/77 10/17/77 10/22/77 11/05/77 11/19/77	18 90 To 60 To N/A 20 39 15 18 12	14 otal	34.5
Grader T950 Power Section T959	1/16/78 1/18/78 2/24/78 2/28/78 3/01/78 3/04/78 3/07/78	40 N/A 6 240** 4 30 5	105 30 6 15 4 30 5	22.5 (excluding 2/28/78)

<sup>\*</sup>Coupler frozen; time required to chip frozen mud.

<sup>\*\*</sup>Lock rim pressures not within specifications; time included diagnosis and delivery of tools. This time was disregarded in the calculation of the total operation average for the Grader T950.

Table 2.5-4. Comparison of Operation Times

Туре	Results of 50-Hour Service Record Time (min)	Results of 28 Feb to 8 Mar Coupling/ Uncoupling Test* Time (min)
Mean Median Standard Deviation	29.9 25.0	10.3 10.0 6.1
Low Time High Time Most Frequent Range	4.0 105.0 15.0 101.0	2.0 30.0 10.0 28.0

<sup>\*</sup> High Time (240 minutes) was not used since time was required for diagnosis and delivery of tools.

A record and test analysis revealed that operation times are lower when the operation frequency is higher. When the operation is not performed frequently (e.g., for 50 operating hours), dirt tends to accumulate in the mechanism, and the locking ring seats preventing the cylinder from moving the mechanism.

It is recommended that the vehicles be coupled and uncoupled periodically and the mechanisms cleaned.

## ·2.5.4.5 Other Observations Recorded

In accordance with the PQT-G Detail Test Plan, paragraph 2.5.5 a. through e., other characteristics were observed and results recorded as follows:

- a. Mobility speed runs (Table 2.5-5).
- b. Night operations (Table 2.5-6).
- c. Shallow-water fording (Table 2.5-7).

# 2.5.5 Analysis

Because DT II was suspended early, only five vehicles had accumulated enough operating hours for an adequate evaluation of fuel and lubricants. Selected test items, however, were subjected to laboratory testing of fuels and lubricants, engine inspection, and lubricant analysis. The procedures indicated that the oil added at Clark Equipment Company was

not to specification (MIL-L-2104B). Operators experienced cold starting problems and a wear metal analysis indicated "... accelerated wear of main bearings in power modules..."

For detail analysis, see Appendix B to this report.

Table 2.5-5. Mobility - Speed Runs

	Tondad!				Avera	ge 2-Way	Average 2-Way Speed (mi/h)	(mi/h)		
Test Item	Empt v	Measured	Test		95	Gear		Lockup	cup	Notes
	(L/E)	Distance	Runs	1	2	3	7	3	7	CL <sup>o</sup>
Distributor	ы	88 Ft	*	4.85	9.95	18.85	27.09	4.85 9.95 18.85 27.09 21.43 31.58	31.58	Steering
	Г	88 Ft	*	4.65	9.45	18.00	4.65 9.45 18.00 25.91 21.43	21.43	31.32	and jerky on
										Can maintain convoy speed of 30 mi/h.
Dozer	1	88 Ft	*	4.62	99.6	18.64	27.17	4.62 9.66 18.64 27.17 21.34 32.17	32.17	Can maintain convoy speed of 30 mi/h.
Dumper	1	88 Ft	*	4.44	60.6	4.44 9.09 16.89	23.68	19.87	28.81	Gross weight
	T	88 Ft	*	4.52	9.26	17.14	25.14	21.02	30.87	Gross weight
	1	88 Ft	*	4.62	89.6	1	26.61	21.56	30.76	Can maintain convoy speed of 30 mi/h.
Grader		88 Ft	*	99.4	9.80	4.66 9.80 19.16	27.65	21.38	32.26	Can maintain
		88 Ft	*	4.61	69.6	18.70	4.61 9.69 18.70 27.11	21.20	31.97	of 30 mi/h.

\* Three runs in 2 direction in each gear.

Table 2.5-6. Night Operations - Adequacy of Illumination for Travel and Work

	Problem Encountered	No known problems. (Total hours of night operations insufficient for conclusion.)	No known problems. (Total hours of night operations isnufficient for conclusion.)		Dozer blade reflectors knocked off in work operations. Light guards bent.	Reflection from dumper rock guard blocks operator's vision.	Lighting inadequate at end of moldboard. Front lights on work section beamed too high for viewing close work.		No known problems. (Total hours of night operations insufficient for definite conclusions.)
umination	Work	ı	1	#	#	×	×	#	ı
Adequate Illumination	Travel	1	l	#	#	#	#	#	1
	Test Item	Compactor (SD)	Compactor (TF)	Distributor	Dozer	Dumper	Grader	Loader	Scraper

Legend: # Adequate
X Inadequate
- Not determined

Table 2.5-7. Shallow Water Fording Test

Problems Encountered					When fording water deeper than 18 inches, water entered breather and then entered axle differential. Brakes degraded after several fordings, until dried out by repeated brake application.		When fording water deeper than 18 inches, water entered breather and then entered axle differential.	
Shallow Water Fording Ability (Poor, Good, Excellent)	Not tested	Not tested	Not tested	1	Pood	Not tested	Good	Not tested
Test Item	Compactor (SD)	Compactor (TF)	Distributor	Dozer	Dumper	Grader	Loader	Scraper

#### 2.6 SAFETY ANALYSIS

## 2.6.1 Introduction

The majority of the safety related data was collected during the contractor's RDAT and EDT. The contractor's safety statement data were reviewed for omissions and were supplemented during the PQT by test and inspection findings. All incidents (EPRs) were reviewed and summarized in the operational test safety release sent to TECOM prior to start of OT.

## 2.6.2 Objectives

a. To determine if there are hazards to personnel during operation, maintenance, storage, or transportation of the test item.

b. To ensure that the optimum degree of safety consistent with the military operational requirement is designed into the materiel and equipment (AR 385-16).

c. To ensure that adequate controls over identified hazards are established in order to protect personnel, equipment, and property (AR 385-16).

d. To ensure that the principles and intent of system safety as outlined in MIL-STD-882A were implemented during the FAMECE Full-Scale Development Phase to obtain the optimum degree of safety within the constraints of operational effectiveness, time, and cost and are attained through the specific application of system safety management and engineering principles.

#### 2.6.3 Criteria

The family of equipment will be designed in accordance with safety engineering principles in order to provide a maximum degree of safety to operator, maintenance personnel, and equipment during all phases of development, testing, and field utilization (paragraph 12.b of MN). The appropriate safety engineering requirements of AR 385-16 and MIL-STD-882A are applicable.

## 2.6.4 Method

Data were collected from four sources:

- a. Equipment examinations by a safety engineer.
- b. Checklist completed by a safety engineer.
  - (1) Table 15-3 of DARCOM Pamphlet 706-134.
  - (2) Checklist in Appendix XIV of test plan (PQT).

- c. Completed operator and maintenance checklists.
- d. All EPRs.

TOP/MTP 2-2-508, Safety Evaluation (Automotive), 27 October 1965 was used as a guide for this subtest. During all subtests, the power module, the work modules, and the power-work module configurations were examined to determine the presence of safety hazards. Particular emphasis was focused on the following areas:

- e. Security of stowage.
- f. Center of gravity.
- g. Hazards due to moving parts.
- h. Adequacy of vehicle lighting and electrical systems.
- Adequacy of safety and warning devices and markings and fault location systems.
- j. Adequacy of ROPS.
- k. Braking characteristics at high and low speed.
- 1. Stability.
- m. Coupling and uncoupling.
- n. Toxic fumes (TOP/MTP 2-2-614).
- o. Noise levels.

Contractor test data were reviewed.

#### 2.6.5 Results

All data pertaining to safety and collected from the tests and checklists are presented in the following Tables:

Table 2.6-1, "Safety Incidents and Recommended Improvements."

Table 2.6-2, "Results of Safety Evaluation Checklist."

Table 2.6-3, "Safety Checklist."

Table 2.6-4, "Toxic Gas Measurements."

# 2.6.5.1 Hazard Severity and Hazard Probability

The following definitions from MIL-STD-882A were used for categorizing hazard severity and hazard probability for the FAMECE. These definitions should be used for interpreting the hazard severity and probability numbers listed in Tables 2.6-1, 2.6-2, and 2.6-3.

# Hazard Severity:

Category I - Catastrophic. May cause death or system loss.

Category II - Critical. May cause severe injury, severe occupational illness, or major system damage.

Category III - Marginal. May cause minor injury, minor occupational illness, or minor system damage.

Category IV - Negligible. Will not result in injury, occupational illness, or system damage.

## Hazard Probability:

Level	Specific Individual Item	Fleet or Inventory
Α	Likely to occur frequently.	Experienced continuously.
В	Will occur several times in item's life.	Will occur frequently.
С	Likely to occur some time in item's life.	Will occur several times.
D	So unlikely, assumed not to occur.	Unlikely, but possible.
Е	Probability of zero.	So unlikely assumed not to occur.
F	Physically impossible.	Physically impossible.

# 2.6.6 Analysis

## 2.6.6.1 General

The method used for the FAMECE safety analysis was to first categorize all safety hazards found, using the data acquisition procedure found in MIL-STD-882A. Once these hazards were categorized, a further breakdown was made to determine the probability of the hazard-producing injury or equipment damage. This combined consideration of the hazard level and probability provides a risk assessment which was used to determine the FAMECE compliance with the specified The risk assessment is determined through qualitative means when an exact requirement does not exist. For example, the presence and adequacy of the fire extinguisher can easily be checked but the existence of maintenance hazards cannot be checked against a list of exact require-Due to the qualitative and subjective nature of the safety analysis, it is probable that some disagreement may exist in assigning both the hazard level and the probability.

In addition, the results of this safety analysis (hazard level and probability) are not the product of a hazard analysis of the FAMECE but are derived from test observations and equipment performance. Not every possible hazard that could occur was considered, but those hazardous conditions arising out of the actual documented use, maintenance, and handling of the FAMECE formed the source of our data.

The determination of major incidents or minor incidents is based on existence of hazards for which protective measures do not exist or are not adequate.

# 2.6.6.2 Specific Analysis of Test Results

## a. Major Incidents (no particular order)

- (1) Service Brake Lock (Grader). The grader brake has been a source of problems with adjustment, overheating, and seizing. Both the Project Manager's Office and the manufacturer have addressed the problems, but complete freedom from locking has not been demonstrated.
- (2) Accelerator Pedal Sticking in High Idle (Power Section). The configuration of the accelerator pedal permits rocks or dirt to get wedged under the lower edge of the pedal (below the hinge point) preventing the accelerator from returning to idle when pressure is released. The pedal system should be redesigned to prevent this problem.

(3) Fire Extinguisher Location (Power Section). The location of the fire extinguisher causes two problems. First, it is located above the fuel and oil filters which themselves are a potential source of fire. Second, when the Power Section is in a puller mode (Dumper, Distributor, Scraper, Compactors), the extinguisher can be reached only after the operator climbs out of the cab and makes his way to the other side of the equipment. The fire extinguisher should be relocated.

#### b. Minor Incidents

- (1) Hood Support Arm (Power Section). This arm has been redesigned with a stiffener behind the spring mechanism, which still does not adequately support the hood if bumped into. It is probable that the hood could fall during maintenance operations, and it is the safety engineer's opinion that this design feature should be corrected.
- (2) Moldboard Clearance (Grader). The moldboard has repeatedly damaged the midmount bearing cover and the hydraulic lines to the grader work section. Although the damage is not usually significant, the clearance problem occurs often. It is the safety engineer's opinion that this design feature should be corrected.
- (3) Tailgate Quick-Release Pins (Dumper). These pins broke and fell out of the tailgate, sometimes a result of operator abuse. They were replaced by bolts and nuts with lockwashers which seemed to correct the problem. The pins will require redesign if they are to be used again.
- (4) Parking Brakes (Most Work Sections). The parking brakes have failed with broken and sticking mechanisms/cables. The modifications made have not eliminated the problems.
- (5) Steering Pump Compensator Adjusting Plug (Power Section). The adjusting plug tends to vibrate out of adjustment with a gradual loss in steering pressure. Although a significant steering loss could eventually occur (Category II hazard), the loss experienced has been gradual and was detected by the operator long before it became a hazard.
- (6) Warning Decals (Power Section). Some decals do not adhere to the equipment. Either the decal material or the the adhesive should be changed.

- (7) Mirror Brackets (Power Section). The brackets break as a result of vibration and misuse (as a handhold) by personnel. The brackets should be redesigned for greater strength.
- (8) Nonadjustable Floodlights (Grader, Dumper). Light reflects off the dumper rock guard, preventing adequate illumination for grader operations. The floodlight brackets should be made adjustable.
- (9) Dolly Wheels (Power Section). Occasionally, personnel inadvertently step on the dolly wheel, which turns freely under the weight. A warning label "NO STEP" has been applied to the dolly wheel support arm but it is doubtful that this will be effective. Some means should be found to restrain the wheel.
- (10) Stepping Surfaces (Power Section). The area under the fuel and oil filters is used in exiting and entering the cab and is often slippery after maintenance or from leaking filters. Some means should be devised to prevent oil and fuel from draining onto these surfaces.
- (11) Hydraulic Lines (Power Section). The main hydraulic lines to the work sections run adjacent to the operator's compartment. The operator could be struck by the hose or hot hydraulic oil should the lines break. Although this condition was not experienced during test, these hoses should be restrained to eliminate any hazard.
- (12) Driveshaft (Scraper). A broken driveshaft universal joint could cause the driveshaft to strike the underside of the operator's compartment. (The cab structure partially shields the operator.) This condition did not occur during testing, but a guard over the universal joint would eliminate this potential hazard.
- (13) Ladder and Tank Area Around Access Hatch (Distributor). One instance was experienced of slipping on the ladder during wet, muddy test conditions. The area around the access hatch should be coated with nonskid material, and the ladder rungs should be made more slip-resistant.

# c. Compliance with Criteria

It is evident that safety engineering principles have been employed in the FAMECE design. Elimination of all safety hazards in equipment of this complexity is difficult. However, the 3 major incidents and 14 minor incidents can and should be corrected. Once they are corrected, and recognizing the inherent limitations in this safety analysis, the criteria would be achieved.

Table 2.6-1. Safety Incidents and Recommended Improvements

Item Component	Incident or Problem	Personnel/ Equipment Impact	Corrective Action Taken	Peconnendation	Class of Hazar (MIL-STD-882A) Severity Probab	Class of Hazard (MIL-STD-882A) Severity Probability
1. Dolly wheels	Drifting down.	Damage to dolly wheels.	Globe valves installed (prevent hydraulic fluid from leaking back into system).	Dolly wheel position 6 valves should be checked periodically during operation to make sure the wheels haven't drifted down. Add caution note in manual.	H	ŭ
2. Dumper tail- gate quick release pin	Loss of pin.	Equipment damage (loss of tailagate).	Installed bolts 6 nuts with lockwashers,	Use bolts until redesigned pins are available.	H	υ
3. Ifood latch	Does not support incod adequately.	Personnel injury (if struck by falling hood).	Mood support arm latch redesigned (not yet proven effective).	Warn mechanics not to bump support arm during maintenance.	H	m
4. Steering system	Steering purp compensator adjusting plug vibrates out of adjustment & causes pressure loss.	Hard steering	Mjusted steering pressure.	Halt operations and check/adjust steering pressure at any sign of hard steering. Add locknut.	Ħ	۵
5. Steering system	Defective hydrau- lic pressure reducing valve.	Gradual pull, side to side.	Replaced valve.	None - one-time random failure of valve.	H	۵
6. Parking brake	Broken cables,	Parking brake would not be operable.	Cable-return spring added (adequacy not yet proven).	Use chock blocks or other means to hold vehicle position if parking brakes are inoperable. Repair parking brake.	H	<b>m</b>
7. Grader service brake	Disc brake on grader has locked.	Personnel injury/ equipment damage. Causes grader to stop suddenly.	Quality assurance problem found with brakes (corrective action not proven).	Maintain additional distance in convoy until brake problem is solved.	H	U

Table 2.6-1. Safety Incidents and Recommended Improvements (Continued)

Iten Component	Incident or Problem	Fersome1/ Equipment Intect	Corrective Action Taken	Recommendation	Class (MIL-Severity	Class of Hazard (MIL-STD-882A) Severity Probability
8. Service brakes	Are degraded after fording.	Brakes would not stop vehicle normally.	Akl warning in manual.	Apply several times to dry out immediately after fording.	H	o
9. Steering control valve	Leaking on operator's feet, brake s accelerator pedals.	Personnel injury/ equipment damage (foot could slip off slick pedals causing loss of vehicle control).	Repair kits have been installed in some of the control valves & appear to have corrected problem.	Stop operations and install seal repair kit.	Ħ	Q
10.Warning decals	Decals coming off the equipment,	Personnel injury/ equipment damage (personnel not warned of poten- tial hazards).	Peplaced decals.	Charye material/adhosive.	7.	ø
ll.Windshield Wipers	Inoperable due to defective pressure regulator.	Wipers not available when needed,	Temporary control valve installed on failed units (replacement parts ordered),	Check wiper operation prior to beginning mission.	H	U
12. Grader mold- board (clear- ance prob- lems)	Front drive disconnect cover damaged & air & hydraulic lines pulled loose. Operator cannot see end of moldxard when he is seated.	Equipment damage.	None.	Add caution in manual. Exercise additional care during moldboard rotation.	Ħ	<
13.Accelerator pedal	Stuck in high idle due to mud/rocks around pedal (more prevalent in muddy conditions).	Personnel injury/ equipment damage (loss of vehicle control).	None.	Check area under pedal fre- quently for rocks/mud. Keep cab area clean. Redesign pedal system.	#	۵

Table 2.6-1. Safety Incidents and Recommended Improvements (Continued)

Table	7.0-1.	ery incldent	s and Recommende	safety incidents and Recommended Improvements (Continued)	(continued)	
Item Component	Incident or Problem	Personnel/ Equipment Impact	Corrective Action Taken	Recommendation	Class of Bazard (MIL-STD-882A) Severity Probability	ard (2A) (billity
14.Mirrors	Broken br <i>ac</i> kets.	Personnel injury/ equipment damage. Inadequate rear visibility with cab installed (when brackets are broken).	Modified mirror brackets (not Lested),	Frequent inspection of brackets. Redesign brackets.	Ш	
15.Floodlights	Reflect off dumper rock guard.	Operator turns floodlights off when backing up dumper.	None.	Use guide for backing up dumper at night. Redesign bracket.	Ħ	U
16.Floodlights	Are not adequate for night grader operations.	Operator has great difficulty seeing grader blade at night.	More.	Exercise additional care during night grader operations. Redesign bracket.	H	o
17.Battery cables	Demeged due to rutbling in access slot & being struck by edge of hood.	Personnel injury/ equipment damage (loss of battery power to vehicle; possibility of fire if storted).	Cable routing changed (not tested).	Prequent inspection of battery cable.	Ħ	υ
18. bolly wreels	Whoels used as a step.	Personnel injury (slipping when stepping on wheel).	Warning in manual 6 warning stencil on wheel cylinder,	Warn operators and main- tenance personnel not to step on dolly wheels.	H	ac
19.Coupler locking ring stuck when trying to uncouple	Operators rapidly move steering wheel back & forth to break loose locking ring. At the same ring, the engine is accelerated to keep up steering.	Personnel injury (if the transmis- sion is inadvert- ently placed in gear, the FMEDE could unexpectedly lurch forward due to the high engine speed).	Instructions in manual require transmission to be in neutral during this particular gretation.	Add warning in menual (make sure that transmission is in neutral during uncoupling operations while disergaging the locking ring).	H	۵

Table 2.6-1. Safety Incidents and Recommended Improvements (Continued)

Item Component	Incident or Problem	Personnel/ Equipment Impact	Corrective Action Taken	Recommendation	Class of Hazard (MIL-SID-882A) Severity Probability
19. (Cont.)	pressure. Personnel are likely to be close to the coupler area observing the locking ring position during this operation is ould be exposed to injury if the transmission is placed in gear.				
20.Coupler lock- ing ring stuck when trying to uncouple	Locking ring stuck 6 Personnel injury. cannot be loosened (Steel bar 6 sleek with release break loose lock- cylinder. ing ring).	Fersonnel injury. (Steel bar & sledge harmer used to break loose locking ring).	None.	Add werning in manual. Operations should be supervised carefully.	2 111
21.Throttle linkage 6 injection pump	Adjustments close to hot surfaces.	Personnel injury (burns).	None.	Add warning in manual (wait until hot surfaces cool).	П
22.Step surface under fuel/ oil filters	Covered with oil from filters.	Personnel injury (fall due to slipping).	None.	Add deflector. Surface should be cleaned after maintenance and other times as macasary.	III B
23.Fire extinguisher	Not easily accessible in configurations where operator faces engine or power section.	Personnel injury equipment damage (fire extinguisher difficult to reach).	Pone.	Relocate fire extin- quisher. Operating personnel should familiarize themselves with the relative loca- tion of the fire extin- quisher in each configuration.	n H

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Improvements (  Recommendation of the cable of the caution backet toward to the caution backet is in backet the constitution of the caution backet is in backet the capital of the caution backet is in backet in manual.		
Safety Incidents and Recommended Safety Incidents and Recommended Safety Incidents and Recommended  support Incidents and Recommended  to rest incident installed cable inpart installed cable (cab area with doctor).  Inch cable (cab area with angle of subsequent in path of with angle).  tealling of equipment damage personnel damage captured and insignal.  tealling of equipment damage captured and size and		
Table 2.6-1. Safety II  Table 2.6-1. Proper to problem to personemt convert to problem personemt cable (converted winch personemt person		
1 01%	2-87	

Class of Hazard (MIL-STD-882A) Severity Probability Safety Incidents and Recommended Improvements (Continued) Recommendation Corrective Action Taken Personnel/ Equipment Impact Incident or Problem Table 2.6-1. Item 24.Doz

24. Dozer winch	rossible winch cable Personnel injury Installed cable breakage & subsequent (cab area would be restrainer guide on whipping, in path of whip- dozer blade (not ping winch cable). tested).	Personnel injury (cab area would be in path of whipping winch cable).	Installed cable restrainer guide on dozer blade (not tested).	request inspection of caple,	Ħ	۵	
25. Loader	Material falling off Personnel injury/back of bucket due equipment damage to operator error. (broken windshield).	Personnel injury/ equipment damage (broken wind- shield).	None.	Operators should be cautioned not to tip bucket back toward cab when bucket is in fully raised position. Also should not overfill bucket. Add warning in manual.	Ħ	۵	

Table 2.6-2. Results of Safety Evaluation Checklist

Question/Requirement	Findings/Inswers	Resultant Hazard (if any)
PART I: GENERAL EQUIPMENT HAZARDS		
<ol> <li>Number, location, type, and accessibility of fire extinguishers provided.</li> </ol>	One 10B:C fire extinguisher provided on ferder above fuel oil filters. Not easily accessible by operator in puller configuration.	II (see Table 2.6-1).
<ol> <li>List of audible warming devices and if they may be heard above vehicle—system noises.</li> </ol>	One device covers following functions and may be heard above normal vehicle noise:	None.
	(1) Low air pressure (4) Converter temperature (2) Low oil pressure (5) Low coolant (3) Engine temperature (6) Low hydraulic reservoir	
3. List of fault-locating systems, if provided.	Four warning lights provided.	None.
<ol> <li>List of critical warning lights and effectiveness of lights with regard to visibility in sunlight, brightness, and color.</li> </ol>	No safety problems found with visibility and colors.	None .
<ol><li>List of auditory backups for systems that cannot be monitored continuously.</li></ol>	See item 2, above.	None.
<ol><li>Identification of inadequate color-code techniques and danger-range problems with gages.</li></ol>	No safety problems encountered in color-code or danger-range identification.	None.
<ol> <li>Location of walking and stepping surfaces not provided with nonskid surfaces.</li> </ol>	<ol> <li>Top of distributor tank around hatch.</li> <li>Rungs of distributor laber.</li> </ol>	III.
8. Identification of inadequate means of access or ingress/egress.	See item 7, above.	ш.
<ol> <li>Identification of inadequate quarding or insulating features.</li> </ol>	<ol> <li>Winch cable breakage.</li> <li>Material falling off back of loader bucket.</li> <li>Battery cables worn through.</li> </ol>	II (see Table 2.6-1). II (see Table 2.6-1). III (see Table 2.6-1).
<ol> <li>Locations of areas where accumulations of grease or oil on vehicle parts could result in personnel injury.</li> </ol>	<ol> <li>Stapping surface under filters on power unit.</li> <li>In cab under steering control value.</li> </ol>	III (see Table 2.6-1). III (see Table 2.6-1).

Results of Safety Evaluation Checklist (Continued) Table 2.6-2.

	Question/Requirement	Findings/Answers	Resultant Hazard (if any)
11.	Location of nonfunctional sharp edges, projecting points, and excessive length of fastening devices.	Emergency brake handle bracket may be bumped by tall operator. Dash on right side may interfere with knees of tall passenger.	IV Negligible.
12.	List of warning circuits that are combined rather than separate.	Same as item 2, above.	Notice.
13.	List of electrical systems or components not properly grounded or protected.	Battery cable insulation worm through.	III.
14.	List of electrical systems or components that could spark and cause a fire or an explosion.	Battery cable.	III.
15.	List of all jacking and hoisting points not clearly and conspicuously marked.	Lift loops on NOPS.	IV Negligible.
16.	Record of all compartments not provided with a positive open-position lock as required.	None noted.	None.
17.	List of latches and struts that are inadequate to secure hinged or sliding components that could cause injury.	Nood support arm inadequate.	III (see Table 2.6-1).
18.	List of foldout assemblies that are not restrained.	None.	None.
19.	List of springs that may be dislodged and cause personnel injury or adjustment screws that are too close to high voltage or excessive heat.	Throttle linkage and injection pump adjustments are close to turbocharger.	III (see Table 2.6-1).
50.	List of systems, linkages, or assemblies that require caution, data, or instruction plates in order to reduce or prevent safety hazards.	<ol> <li>Hydraulic tank hot surface.</li> <li>Hearing protection on power section.</li> <li>Articulation warning.</li> <li>Dropping dump body stands.</li> <li>Operator's instructions in cab.</li> <li>Wo step" on dolly wheel support arm.</li> </ol>	All items have caution plates as required. Also see Table 2.6-1 for dolly wheels.

Results of Safety Evaluation Checklist (Continued) Table 2.6-2.

	Question/Pequirement	Findings/Nuswers	Resultant Nazard (if any)
6	Are the windshield wipers adequate for their intended use?	Уев.	None (see Table 2.6-1 for failure condi- tions).
	Does the operator's compartment provide clear visibility for all operations?	Visibility for grader operations is a problem with the cab installed.	III (see Table 2.6-1).
60	Is fresh air ventilation adequate for operator's compartment?	No ventilation problems were noted.	None.
6	Is a master electrical disconnect switch available and easily reached by the operator?	Switch is mounted on the battery box (not easily accessible in the puller configuration, and not easily accessible in the pusher configuration with the canvas cab in place).	III Marginal.
10.	Are rear view mirrors adequate?	Mounting brackets are not adequate.	III (see Table 2.6-1).
ä	Are any safety hazards created by fording operations?	Some brake degradation is experienced after fording operations, but not unusual for this type of equipment.	III (see Table 2.6-1).
12.	Will the scraper apron locking device secure the apron in the fully opened position?	Yes.	lore.
ij.	Is a positive locking device provided to hold scrpeer bowl in raised position for all transport modes?	Yes.	None.
14.	Is a positive locking device provided to secure ejector in both full forward and full returned positions?	Yes (but inconvenient).	IV Negligible.
15.	With the moldboard sideshift in center position, does the operation of any grader controls cause interference which might result in equipment damage or component failure?	Interference was noted which damaged both the midmount bearing cover and manifold hoses.	III (see Table 2.6-1).

	Table 2.6-2. Results of	Table 2.6-2. Results of Safety Evaluation Checklist (Continued)	(penui
	Question/Requirement	Findings/Mowers	Resultant Hazard (if any)
16.	Is a positive mechanical lock provided to hold the dozer blade in raised position not less than 20 inches above the ground?	Yes.	None.
17.	Does the dozer blade lock require the use of any tools for application?		
18.	Will the dozer blade lock withstand the maximum downward force at the closer hydraulic system?	Yes.	None.
19.	Is the dumper bed adequate for troop transport?	See HFT subtest.	See IFF subtest.
20.	Does the dumper rock-guard over the operator's cab offer adequate protection?	Yes.	None.
21.	Is distributor manhole access to tank adequate?	Yes.	None.
22.	Does distributor access ladder have adequate norslip steps?	No. Ladder steps should be inproved. They seem to be adequate for most operations, but caked mud on boots could cause a slipping hazard.	III.
23.	Does tank overflow contact distributor chassis, power train, or walking/working surfaces?	Condition not noted.	IV Megligible.
24.	Are batteries and battery box located away from heat, well ventilated, and equipped with drain holes?	Yes.	None.
25.	Is the vehicle air horn adequate?	Yes.	None.
26.	Are the seat belts adequate and installed per SAE J386?	Yes (in accordance with manufacturer's certification).	None.

Table 2.6-3. Safety Checklist (AMCP 706-134, Table 15-3)

	Question/Requirement	Findings/Answers	Resultant Nazard (if any)
N	Numbered per Test Plan		
7	Are mechanical guards provided on all moving parts of machinery and transmission equipment in which personnel may become injured or entangled?	Scraper driveshaft/universal joint is unguarded below and behind the operator's compartment. Breakage at the joint could endanger the operator from the broken end of the shaft hitting the seat. The probability of occurrence is extremely low.	III Marginal.
2.	Are edges of components and maintenance access openings rounded or protected by rubber, fiber, or plastic protectors to prevent personnel injury?	Yes.	None.
e.	Are portable hand-operated fire extinguishers provided where fire hazards exist or may be created, and are they of the correct type?	Yes.	None (see Table 2.6-) for accessibility).
4	Are fire extinguishers placed where they are readily accessible, but not immediately adjacent to points where fire would probably originate?	Not easily accessible.	I (see Te'se 7 6-1)
6	Are audible warning signals distinctive and unlikely to be obscured by other noises?	Yes.	None.
.9	Not applicable.	N/A.	N/A.
7.	Are critical warning lights isolated from other less important lights for best effectiveness?	No; all are on same panel.	IV Negligible.
æ	When selecting warning lights, are they compatible with ambient illumination levels expected? Are dimmer controls utilized, if nocessary?	No safety problems were found with the warning lights. The safety evaluation does not address, however, any HFE shortcomings/deficiencies.	None.
	Do displays which cannot or may not be watched continously, but which require continuous monitoring, have suitable auditory warning backup?	Yes.	None.

Table 2.6-3. Safety Checklist (Continued)
 (AMCP 706-134, Table 15-3)

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	Question/Requirement	Findings/Answers	Resultant Hazard (if any)
ë	Not applicable.	N/A .	N/A.
ä.	Are color code techniques utilized which define operating and danger ranges to simplify checkreading?	Yes.	None •
12.	Are control circuits and warning circuits designed so they are never combined?		
13.	Are on-off or fail-safe circuits utilized wherever possible to minimize failures without operator knowledge?	Yes •	None.
14.	Not applicable.	N/A.	N/A.
15.	Not applicable.	N/A.	N/A.
16.	Do vehicle electrical systems include suitable provisions to prevent sparking and other conditions which might cause fire or explosion when usage involves volatile and/or combustible materials?	See Table 1, No. 17.	ш.
17.	Not applicable .	N/A ·	N/A.
18.	Are jacking and hoisting points clearly, conspicuously, and unambiguously identified?	Yes,	None .
19.	Not applicable.	N/A.	N/A.
20.	Not applicable .	N/A.	N/A.
21.	Are struts and latches provided to secure hinged and sliding components against accidental novement which could cause injury to personnel during maintenance operations?	itood support arm not adequate.	III (see Table 2.6-1).
22.	Not applicable.	N/A.	N/A.

Table 2.6-3. Safety Checklist (Continued) (AMCP 706-134, Table 15-3)

	Owstion/Requirement	Findings/Answers	Resultant Hazard (if any)
23.	Are conspicuous placards mounted adjacent to high-voltage or very hot equipment?	les.	IV Negligible.
ž	Do switches or controls which initiate hazardous operations, such as ignition, crame moving, etc., require the prior operation of a related or locking control?	Yes.	None .
25.	Not applicable.	N/A.	N/A.
26.	Not applicable.	N/A.	N/A.
27.	Not applicable.	N/A.	N/A.
28.	Are components located and mounted so that easy access may be achieved without danger to personnel from electrical charge, heat, sharp edges and points, moving parts, and chemical contamination?	See No. 19 under general equipment hazards.	IV Negligible.
29.	Are mechanical components which require use of heavy springs designed so that the spring cannot be inadvertently dislodged and cause personal at jury or damage to components?	Yes.	. Hone .
30.	Are warning plates provided wher? inchanical assemblies, linkages, springs, etc., are unler constant strain or load?	No; no areas found where this would be necessary.	None.
31.	Not applicable.	N/A.	5
32.	When internal combustion engines are a part of the equipment, are the exhausts routed properly to prevent a concentration of carbon monoxide in the cab?	Yes.	None.
33.	Not applicable.	N/A.	N/A.
34.	Not applicable,	N/A.	N/A.

	Question/Requirement	Pindings/Answers	Resultant Hazard (if any)
	35. In designing vehicles and their components, are materials used which will not produce hazardous environments under severe operating conditions?	No problems were found in this area. However, the test activity did not attempt to expose the equipment to extreme high temperatures which would probably be required to liberate toxic or combustible gases.	None.
.:	36. Are exhaust pipes of internal combustion engines pointing upward to lessen danger of igniting flammable liquids which may collect on the ground or floor?	No; the exhaust pipe is routed horizontally to meet IR suppression requirements.	IV Negligible.
	37. Are warning lights provided to indicate fire or excessive heat in areas not visible to drivers of vehicles?	Yes; high engine temperature and high converter temperature.	None .
	38. Is the correct type of fire extinguisher mounted on vehicles at the driver's position?	No; not at driver's position in puller mode.	п.

Table 2.6-4. Toxic Gas Measurements

Test Condition	Cartx	Carbon Monoxide (co)	Carb	Carbon Dioxide	Sulf	Sulfur Dioxide	Nitro	Nitrogen Dioxide
	नुष्ट	Cab Dumper Bed	विष्ठ	Cab Dumper Bed	ट्टि	Cab Dumper Bed	3	Damper Bed
Warmup engine at idle	0	0	.258	0	0	0	0	0
 After 15 minutes travel at 15 to 20 mi/h on gravel loop	0	0	0	0	0	0	0	0
 After 30 minutes travel at 15 to 20 mi/h on gravel loop	0	0	0	0	0	0	0	0
Engine at 2000 r/min facing into wind	0	0	0	0	0	0	0	0
Engine at 2000 r/min with wind toward buddy seat	0	0	0	0	0	0	0	0

btes:

1. Test conditions:

14 Feb 1978	1030	32°F	29.700	8 knots	MW	78%	Fort Belvoir, WA	MERALYYM TOST Area
• Date 14 Feb 1978	Time 1030	Temperature 32°F	Barometric pressure 29.700	Wind speed	Wind direction	Pelative humidity 78%	Location Fort Belvoir, VA	

2. Test equipment characteristics:

	S	Sensitivity Range	Pange	
Equipment	8	200	202	ZON
MBA Universal Tester	10-3000 P/m		1	'
Bendix Gastec Model 400 Pump		1-108	5-100 P/m	1-30 P/m

#### 2.7 HUMAN FACTORS

## 2.7.1 Noise

# 2.7.1.1 Objective

To determine whether the sound pressure levels at the operator's station and in the bed of the dumper exceed safe limits.

## 2.7.1.2 Criteria

Noise requirements for FAMECE shall conform to MIL-STD-1474A, "Noise Limits For Army Materiel."

## 2.7.1.3 Method

The sound pressure levels were measured at the operator's seat and in the bed of the dumper; individual bandwidths from 63 Hertz through 8000 Hertz were measured and an overall noise level was calculated.

## 2.7.1.4 Results

Test results are given in Table 2.7-1.

# 2.7.1.5 Analysis

With the exception of "IDLE" condition, all sound pressure level measurements exceed the 85-dBa maximum allowable for 8-hour exposure as specified in MIL-STD-1474A; therefore, hearing protection will be required for the operator and any passengers riding in the dumper bed.

#### 2.7.2 Toxic Gases

The toxic gases test is contained in the SAFETY section of this report.

## 2.7.3 Operator Seating

# 2.7.3.1 Objective

To determine whether MOS-qualified personnel can effectively operate all equipment controls when seated in the cab of the power section.

Table 2.7-1. Dumper Noise Measurements (dBa)

Band					
Width	ldle	Max r/min		72 m1/h	75 m1/n
(Hz)	(Cab)	(Cab)	r/min (Cab)	(Cab)	(Damber bed)
63	95	95	95	105	105
125	06	86	95	100	100
250	85	100	95	102	95
200	81	95	91	86	06
1000	79	92	92	92	80
2000	75	87	98	90	75
4000	65	83	80	82	70
8000	55	75	76	75	65
Overall Noise Level (dBa)	84.1	97.4	95.3	99.3	91.4

# NOTES:

- . Measurements made with fabric cab installed.
- Overall noise level calculated in accordance with TB MED 251. 2.

## 2.7.3.2 Criteria

Operator seating must accommodate a 5th to 95th percentile soldier dressed in arctic clothing.

# 2.7.3.3 Method

Clearances were measured between the operator's seat and surrounding equipment structures and controls. These dimensions were compared with the clearances recommended in MIL-STD-1472B. The reach required to operate controls was compared to the anthropometric data for 5th percentile soldiers.

## 2.7.3.4 Results

All switches and controls in the operator's station were within reach of the 5th percentile soldier. A comparison of actual clearances and clearances recommended in MIL-STD-1472B is shown in Table 2.7-2.

# 2.7.3.5 Analysis

The clearance distances from the operator's seat to structures and controls surrounding the seat meet the requirements of MIL-STD-1472B and facilitate effective control of the equipment by MOS-qualified personnel; however, the handle of the parking brake in the set position presents an obstruction to an operator entering the cab.

Table 2.7-2. Recommended and Actual Clearances Around Operator's Station (Dumper)

	(MIL-Tab	Clearances (in.) (MIL-STD-1472B, Table XXIV)	Cle	Actual Clearances (in.)
Elbow (dynamic).	A.		Α.	N/A
Elbow (static). Shoulder.	C. 50	23.00	C 62	23.00
Knee width (minimum).	D.		D.	23.00
Knee width (optimum).	. Э		E.	8.75
Boot - provide adequate clearance to operate brake pedal without inadvertent acceleration operation.		00.9	4	3.00
Pedals (minimum).	6.	2.00	6.	8.00
Boot - provide adequate clearance to operate	H.		н.	1
accelerator without interference by brake pedal.	31.			
Head (seat reference point to roof line).	1.	42.00	1.	1
Abdominal (seat back to steering wheel).	2.		2.	21.50
Front of knee (seat back to manuals/controls on dash).	on dash). 3.	29.00	3.	31.00
Seat depth (seat reference point to front edge of seat pan).			7.	17.00
Thigh (underside of steering wheel to seat pan).	3). 5.	9.50	5.	10.00
Seat pan height.	6.	15.00	.9	17.50
Boot (front of steering wheel to heel point of accelerator).			7.	16.25
Minimum mitten clearance around steering wheel.		3.00	8.	4.75
Knee-leg-thigh (brake-clutch pedal) to lower edge of	edge of 9.	26.00	9.	26.00

Notes:

Recommended clearances are for accommodation of 95th percentile soldier in arctic clothing.

. Operator seat in rearmost position for all measurements.

# 2.7.4 Visibility

# 2.7.4.1 Objective

To determine the adequacy of internal and external visibility provided the operator.

# 2.7.4.2 Criteria

Visibility shall meet the requirements of paragraphs 5.2 and 5.12.5 of MIL-STD-1472B. Interior lighting shall permit effective operation during night and blackout conditions. Caution and warning lights shall not "wash out" under daylight conditions.

## 2.7.4.3 Method

The external field of view (forward and rearward) from the operator's eye position was noted and compared to requirements of MIL-STD-1472B. Also noted were the viewing distances to the ground.

The luminance of the individual gauges was measured using a spot brightness meter. The locations and visibility of the gauges were also noted and compared to the requirement.

# 2.7.4.4 Results

a. External Visibility. The external field of view from the operator's seat (without fabric cab installed) slightly exceeds the 180° minimum requirement of MIL-STD-1472B. However, the operator cannot view the ground any closer than 10 feet forward of the dumper. The minimum ground viewing distance varies with direction, reaching 21 feet 4 inches when looking directly over the hood.

The rearview mirrors provided on FAMECE had a low survivability rate and sometimes were missing from the vehicle. The plastic windows of the cab often became coated with a residue of dirt and water, reducing visibility. The reduced visibility may have been a significant contributing factor in nine documented (EPR) instances which ranged from a broken fender, caused by striking tree stumps, to a near accident. A second contributing factor to poor visibility is the location of the operator. With the exception of the dumper, most industrial construction equipment designs place the operator's station along the centerline of the vehicle, whereas in FAMECE, the operator is never located along the centerline. This results in diminished road and curb side visibility.

In addition to the general complaint concerning visibility, four specific visibility problems were associated with FAMECE:

- (1) Loader operator cannot see the front wheels.
- (2) Dumper operator cannot see passengers in the bed.
- (3) Grader operator cannot see the moldboard.
- (4) Distributor operator has difficulty determining the water level using the sight gauge provided.

The loader accident mentioned in the previous paragraph was the result of the operators not noticing that, due to the slope of the ground, the front left tire was several inches above the right tire. When the operator raised a loaded bucket, the center of gravity changed and caused the loader to tip over onto the passenger side.

When carrying passengers in the bed of the dumper, the operator cannot see the passengers, and the passengers have no means of signaling the operator. The noise levels preclude shouting, and banging on the rockguard by passengers is not adequate communication.

The moldboard on the right side of the grader is not visible to the operator. There were frequent occurrences of the blade being moved too far to the right and damaging various subassemblies, including the air hose supplying pressure to the grader brakes.

The water distributor sight glass is located on the left front corner of the water tank, requiring the operator to look over his left shoulder to see the glass. The problem increases when mud is thrown up by the tires and covers the sight glass.

## b. Internal Visibility

(1) Line of Sight Visibility. All gauges on the righthand instrument panel exceed the minimum requirements of 45° from the normal line of sight. The actual angle varies from 46° to 50° depending on the height of the gauge from the floor of the cab and the height of the adjustable seat. This introduces some parallax into the readings. Included on this panel are the converter oil temperature, engine lubricating oil pressure, brake system air pressure, voltmeter, hourmeter, and tachometer. It is possible for the operator to place his knee in the line of sight of these gauges and the associated warn-Not having the warning lights grouped together ing lights. is a violation of paragraph 5.2.2.1.5 of MIL-STD-1472B. Also, the location of the speedometer away from all other gauges does not meet requirements of paragraph 5.2.1.3.6 of the standard.

(2) Lighting. The right-hand panel is illuminated with one red floodlight. The speedometer gauge is provided with its own integral red lighting. The difference in brightness of the two lights is considerable. The speedometer lighting was so dim as to register below .001 foot-lamberts. when measured with a photometer. A determination of luminance contrast was not possible due to the dimness of the gauge. The technician, although not completely dark adapted, was unable to distinguish the speedometer pointer beyond distances of 8 inches. The floodlighting provided is adequate to determine the position of the various switches on the panel but is positioned so as to be of aid in the reading of the speedometer.

The left-hand panel is provided with white lighting. The use of white lighting is not consistent with dark adaptation. The average luminance value for the gauges was .145 lamberts. The measured contrast ratio was 88%. Both of these values meet the requirements for FAMECE. The warning lights provided with each gauge were originally red in color; however, due to age and field use, the red coating had worn off and the lights were essentially white in color. When measured, the luminance values exceeded the range of the photometer being used. This value (10 foot-lamberts) greatly exceeds the brightness limit, 1 foot-lambert, as listed in Table XX of MIL-STD-1472B. Because of the worn condition of the red coating on the lights, no attempt was made to determine "washout" of caution and warning lights.

#### (3) Other incidents noted were:

- (a) Both the tachometer and speedometer experienced condensation beneath the glass which interfered with reading both dials.
- (b) The lamp test switch is incorporated into the start button. Depressing the button with the engine running tests the lights. This switch is labeled only "START," with no mention of its secondary function.

## 2.7.4.5 Analysis

Operator visibility both internally and externally is poor. This is especially true at night when the operator cannot maintain night adaption. The instrument lighting provided is poor and should be redesigned, and the cab reduces external visibility to the point of degrading performance.

# 2.7.5 Control/Display Integration

# 2.7.5.1 Objective

To determine whether the location and grouping of controls and displays is in accordance with good human engineering practices and accepted industry standards.

# 2.7.5.2 Criteria

The location and grouping of controls and displays shall meet the requirements of paragraphs 5.1 and 5.4 of MIL-STD-1472B and the accepted industry practice as specified in the SAE Handbook.

## 2.7.5.3 Method

The design of the FAMECE power section was compared to paragraph 5.1 of MIL-STD-1472B. The location, grouping, and direction of movement of controls was compared to the SAE handbook for compliance with industry standards.

## 2.7.5.4 Results

With one exception, the design of the FAMECE power section meets the requirements of MIL-STD-1472B — the tachometer and speedometer, functionally related displays, are not located near each other. The tachometer is located on the left-hand panel and the speedometer on the right-hand panel.

The general requirements of SAE have been met; however, with the exception of the grader, specific industry standards do not exist for the location and grouping of controls. With regard to the grader controls, SAE J1071 specifies the direction of control movement resulting in a corresponding movement of the grader. The Circle Reverse, Circle Side Shift, and the Blade Side Shift controls of the grader do not meet the industry standards. For example, moving the "Blade Side Shift" control forward moves the blade to the right; SAE J1071 calls for a forward movement of the control to move the blade to the left. Other differences in FAMECE equipment design from SAE requirements are:

- a. SAE J1071 calls for the transmission controls to be located for right-hand operation; in FAMECE, it is a left-hand operation.
- b. Just as in the other work sections, the grader controls are separated into groups; however, unlike the other sections, where the controls are right-hand operations, the position of the grader controls requires operation by both hands. The

Left-Hand Blade Lift and the Right-Hand Blade Lift are located to the left of the steering wheel. The Blade Tilt and Blade Side Shift are located just to the right of the steering wheel. The Circle Side Shift, Circle Reverse, and the Scarifier are located to the far right of the steering wheel.

#### 2.7.5.5 Analysis

With training and experience, engine sound often replaces the tachometer as the source of information concerning engine speed. This probably explains why few operators complained about the location of the tachometer.

The lack of problems with the grader controls could be due to the inexperience of the operators with other industrial graders. While the industrial graders generally position the operator along the centerline of the vehicle, the FAMECE operator sits to one side. The design for these controls is consistent with the operator's location and good human engineering principles and meets the requirements of paragraph 5.4.1.2.1 of MIL-STD-1472B.

#### 2.7.6 Observation

#### 2.7.6.1 Objective

To observe the human engineering aspects of FAMECE operation, including ingress/egress, normal operation, coupling/uncoupling, and maintenance.

#### 2.7.6.2 Criteria

The requirements of MIL-STD-1472B and good human engineering practice. Coupling/uncoupling must be accomplished in a maximum time of 30 minutes for each operation.

#### 2.7.6.3 Method

Data were obtained by observing personnel operating and maintaining FAMECE and by reviewing equipment performance reports.

#### 2.7.6.4 Results

- a. Ingress/Egress. The ladder is not centered in the entranceway resulting in an awkward reach for the handrail. Other factors which make ingress/egress difficult are:
- (1) The mirror is mounted directly above the ladder, causing the operator to strike his head when entering the vehicle.
- (2) The dolly wheels, located directly below the entranceway, offer an inviting step. Someone trying to use the wheels as steps could be seriously injured.
- (3) The front lifting eye on the road side of the dumper, as presently located, is a tripping hazard.
- (4) The cab door opens across the entrance platform, requiring personnel attempting to enter the cab to stand on the ladder and make an awkward reach to open the door. The cab door is only 14.5 inches wide.
- b. Coupling/Uncoupling. The coupling/uncoupling operation, performed by two enlisted men and one NCO, was carried out on level, rough terrain at night. The use of flashlights, in addition to vehicle lights, was necessary for task performance. All personnel wore gloves rather than mittens. Coupling/uncoupling operations were each carried out within the 30 minute requirement.
- c. Normal Operation. The following problem areas, in addition to those previously mentioned, were observed during operation.

- (1) The fire extinguisher, located behind the battery box, does not rotate with the cab; thus when the vehicle is in the puller mode, the operator cannot reach the fire extinguisher without crossing the cab.
- (2) The tailgate support pins, originally designed for removal by hand, jam and require the use of a hammer for removal. The pins, located 73 inches from the ground, are beyond the 71.5-inch reach of the 5th percentile soldier.
- (3) The exhaust located at eye level of a 95th percentile soldier directs emission into the faces of personnel working on the curb side of the vehicle.
- (4) The size and location of the "buddy seat" is inadequate for the 95th percentile soldier. The lack of shoulder clearance (with cab installed) is aggravated by vibration from rough roads. The seat backrest is 10 inches in height, instead of the required 18 inches.
- (5) Operators complained about the limited capacity and slow recovery rate of the air reservoir system.
  - (6) The labeling on controls peeled constantly.
- (7) The body cover for the dumper bed was not available during testing. The combined effect of heat transfer to the cold truck body and the lack of a body cover will cause discomfort for personnel riding in the back of the dumper.
- (8) The floor of the bed does not have any means for securing the cargo carried along with passengers, nor does it have any means by which the passengers can brace themselve.
- (9) Passengers have no means of communicating with the driver.
- (10) The height of the first step of the tailgate measures 27.5 inches; the maximum height according to MIL-STD-1472B is 16 inches.
- (11) The steering valve, located above the operator's right foot, has a high failure rate and leaks oil onto the operator's right foot, the brake, and the accelerator.
- (12) The engine hood does not have a positive lock for the open position. A strong wind could close the hood and result in serious injury to personnel working under the hood.

# 2.7.6.5 Analysis

The most serious of the problems observed and those warranting correction are:

- a. Ingress/egress.
- b. Location of the fire extinguisher.
- c. Tailgate support pins.
- d. No method to communicate between passengers in the bed and the driver.
  - e. No positive lock for the engine hood.

#### 2.7.7 Vibration

#### 2.7.7.1 Objective

The objective is to assess the ride quality of the FAMECE at both the operator's station and in the bed of the dumper.

#### 2.7.7.2 Criteria

The FAMECE ride quality will be compared to the standard Army 5-ton truck.

#### 2.7.7.3 Method

Vibration measurements were taken at two locations on each vehicle with an accelerometer. The locations chosen for FAMECE were beneath the driver's seat and on the road side of the dumper bed, 6 inches behind the axle and 6 inches from the side wall of the bed. On the 5-ton, there is no free space beneath the driver's seat. Therefore, the underside of the dash panel was used instead. Both the driver's seat and the dash panel are hard mounted to the cab of a 5-ton truck and, therefore, should be subjected to the same levels of acceleration. The selected location for the bed of the 5-ton corresponded to that picked for FAMECE (i.e., road side of the bed, 6 inches behind the axle, and 6 inches from the side wall of the bed).

In all cases, the vibration pickup was placed so as to measure vibration in the vertical axis only. A frequency of 5 Hertz was chosen for measurement because, as can be seen from Figure 36 of MIL-STD-1472, the human body is most sensitive to vibration at this frequency.

Both vehicles were driven over identical courses at speeds of 10, 15, 20, 25, and 30 mi/h. All vehicles were driven over the same section of the course at the same speed. The course consisted of three sections: paved road, unpaved road, and cross country. The vibration data were recorded on tape and later plotted on standard graph paper for comparison.

Along with the objective comparison of the two vehicles, a subjective evaluation was also done. The accessory passenger seats were installed in the aft of the FAMECE dumper bed, and 11 members of an engineer squad were asked to ride in both vehicles over the same course used for the objective test. The engineers carried the following tool kits with them into each vehicle during test: Long Pioneer, Short Pioneer, Carpenter, Demolition, and Mine Detector Tool Kits (Figure 2.7-1). Army procedure calls for the tool kits to be restrained while being transported in the 5-ton. However, since tying down the tool kits was not the common practice with the engineers used



Figure 2.7-1. Engineers and tool kits in dumper.

in this test, the kits were not tied down in the 5-ton truck. The FAMECE does not have provisions for tying down equipment carried in the bed of the dumper. After the test, the participants were asked to fill out a questionnaire which asked for a comparative rating of different aspects of the vehicles.

#### 2.7.7.4 Results

The results for the paved and unpaved sections of the road test are presented in graphical form in Figures 2.7-2 through 2.7-7.

Because of the severity of the terrain traversed during the cross-country portion of the test, drivers were unwilling to drive at any but very low speeds (0 to 4 mi/h) and were unable to maintain a constant speed. Therefore, a comparison of the two vehicles for cross-country performance was not completed.

The subjective opinions of the engineer squad to the questionnaire have been summarized and presented in Table 2.7-3.

#### 2.7.7.5 Analysis

As can be seen in Figures 2.7-2 through 2.7-4, the FAMECE operator's seat subjects the occupant to considerably less vibration than the 5-ton truck. This result is obviously due to the difference in construction of the two seats. As previously stated, the driver's seat in the 5-ton is hard-mounted to the frame of the cab. The operator has only a few inches of cushion material between his body and the source of the vibration. The FAMECE seat includes an adjustable vibration damping mechanism built into the seat.

With regard to the bed of each vehicle, there seems to be little difference between FAMECE and the 5-ton. Both vehicles subject passengers riding in the cargo areas to high levels of vibration.

The responses to the questionnaires indicate an overall satisfaction with FAMECE and a clear preference over the 5-ton truck. This preference was especially clear when it came to comparing the vehicles in cross country travel. Considering the similarity in the levels of vibration, the preference is probably best explained in terms of the difference in shape of the cargo areas. The FAMECE dumper is shaped so as to provide a distinct bench seat on either side of the vehicle. The engineers placed their tool kits in the bottom of the cargo area and sat on the steel bench seats (Figure 2.7-1). This arrangement does not allow the tool kits much freedom of movement and the high side walls of the FAMECE dumper provides a large backrest against which to brace oneself. This

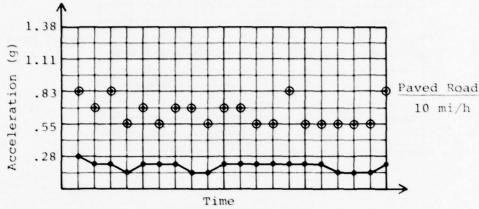
contrasts sharply to the arrangement in the 5-ton. Here, the troops sat on their tool kits which were placed against the side walls of the truck. Positioned in this fashion, the troops were seated on boxes which were not restrained. Also, the height differential between the tool kits and the side walls left very little backrest against which to brace themselves.

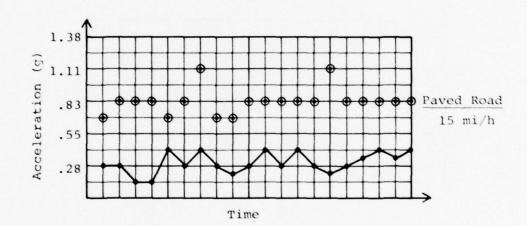
Three other points from the returned questionnaires are noteworthy:

- a. Although required to carry only a squad of 8, the 11 test participants generally felt there was more than adequate room for themselves and their equipment.
- b. The test was conducted on a sunny day with temperatures in the mid-seventies. In spite of the pleasant weather, three soldiers complained about sitting on bare steel. In colder weather, the effect of body heat being transferred to the cold steel bed can be expected to be considerably more pronounced.
- c. Of 4 men who sat with their backs next to the lifting eyes of the dumper bed, 2 asked that they be moved to preclude a head strike.

Legend:

- FAMECE operator seat
- 5-ton truck cab seat





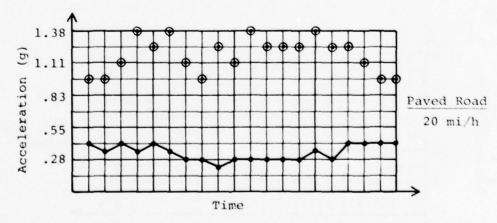
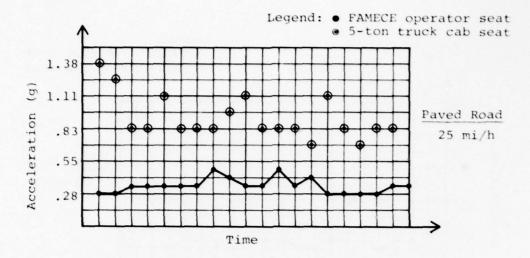
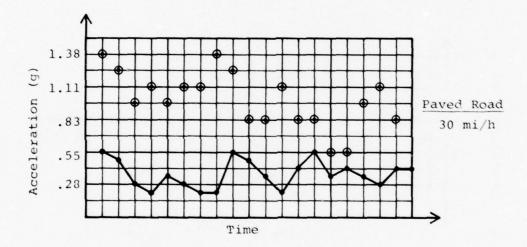


Figure 2.7-2. FAMECE and 5-ton truck vibration transmission.





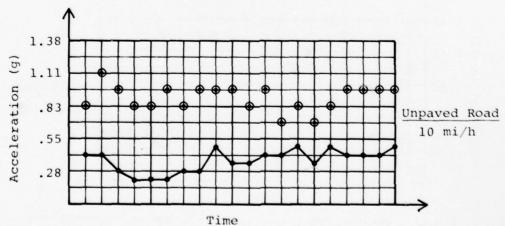
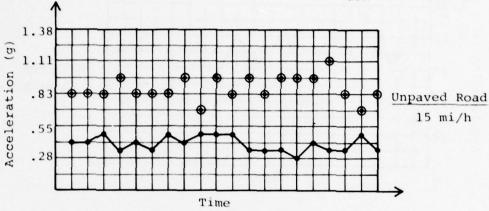
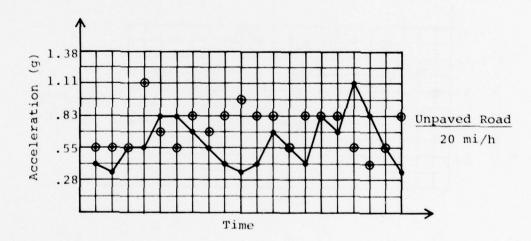


Figure 2.7-3. FAMECE and 5-ton truck vibration transmission.

#### Legend:

- FAMECE operator seat
- 5-ton truck cab seat





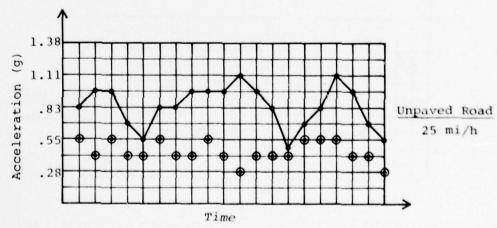
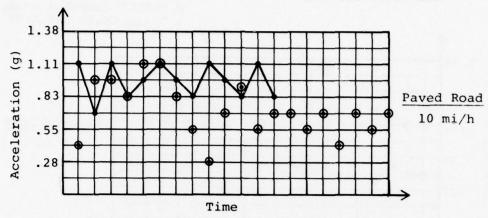
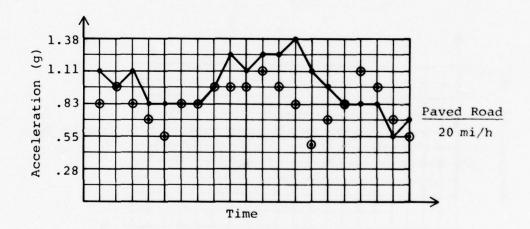


Figure 2.7-4. FAMECE and 5-ton truck vibration transmission.

#### Legend:

- FAMECE dumper
- 5-ton truck bed





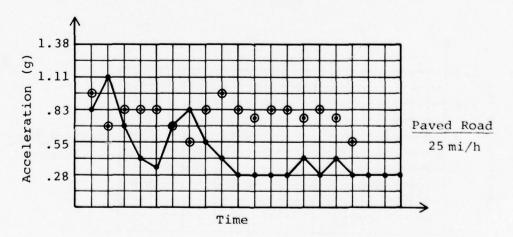
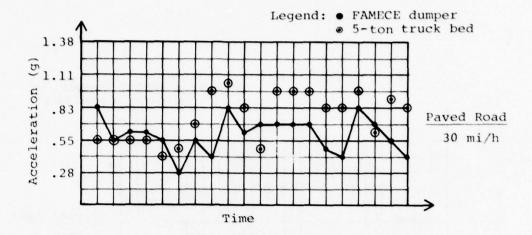
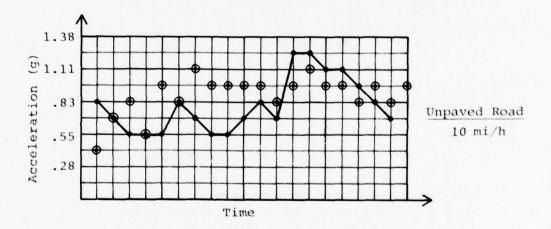


Figure 2.7-5. FAMECE and 5-ton truck vibration transmission.





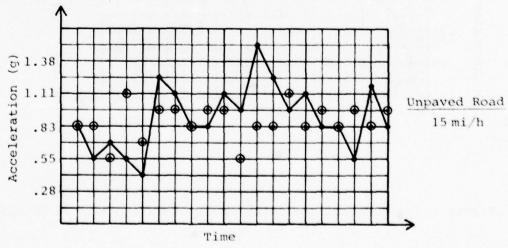
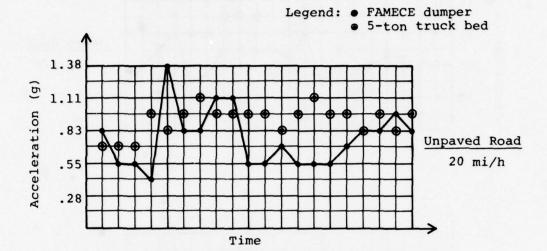


Figure 2.7-6. FAMECE and 5-ton truck vibration transmission.



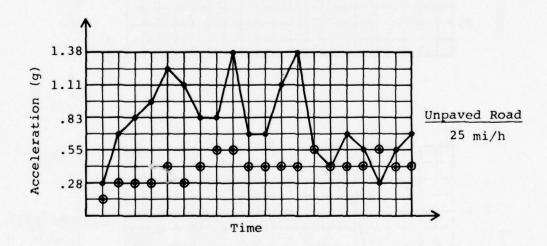


Figure 2.7-7. FAMECE and 5-ton truck vibration transmission.

Table 2.7-3. Comparative Rating of Ride Quality of FAMECE Dumper and Standard 5-Ton Truck

QUE	STIONNAIRE					
NAME: RANK: YEARS IN SERVICE: (RESPONSE FROM 11 TEST PARTICIPANTS YEARS IN MOS: ARE ENTERED BELOW) AGE: HEIGHT: WEIGHT:						
Instructions: You are participating in a field test to evaluate the ride quality of the FAMECE dumper. For each question below, please check the one column which most closely expresses your opinion.						
	Excellent Good Fair Poor Terrible					
Ease of entering the dumper bed	3 6 2					
Ease of loading equipment into the bed	2 6 3					
Adequacy of space for carry ing equipment and men	2 6 2 1					
Smoothness of the ride on concrete road	5 4 2					
Smoothness of the ride on						
rough terrain a. Dirt road b. Cross country	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$					
How does the 5-ton dump tru ride quality?	ck compare with FAMECE as far as					
Concrete road Dirt road Cross country Comments:	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$					

Table 2.7-3. Comparative Rating of Ride Quality of FAMECE Dumper and Standard 5-Ton Truck (Continued)

For the following questions, please write out your answers.

1. a. While riding in FAMECE, were you ever bounced out of your seat?

> FAMECE: Yes - 3, No - 8 5-Ton: Yes - 5, No - 1

b. At any time were you worried about being bounced out of the dumper bed?

FAMECE: Yes - 1, No - 10 5-Ton: Yes - 3, No - 2

2. How much did the equipment placed in the bed move around because of vehicle vibration?

FAMECE: Not very much 5-Ton: A lot more than FAMECE

3. Did any of this equipment cause you concern as far as its moving around and possibly striking you?

FAMECE: Yes - 0, No - 11 5-Ton: Yes - 4, No - 2

4. Do you have any recommendations to make to improve FAMECE so as to make it easier in which to ride?

Three requests for something other than steel to sit on; two requests for moving the lifting eyes; and three comments concerning dust entering the bed.

#### 2.8 MAINTENANCE ANALYSIS

#### 2.8.1 Maintainability Indices

#### 2.8.1.1 Objective

To evaluate all maintenance data generated as a result of maintenance performed in support of the test items during the test and, based on these data, to compute various maintainability indices for comparison to the applicable criteria.

#### 2.8.1.2 Criteria

- a. Operator Daily Services and Inspections. (Essential) Requirements for inspections must be kept to a minimum. Before-operation and after-operation checks and services will not exceed an average of 30 minutes each [MN (ED) (QMR), para 11.j.].
- b. Scheduled Maintenance. (Essential) Requirement for scheduled maintenance other than operator daily checks and services shall be established at 250 (desirable 400) hourmeter hours or quarterly, whichever occurs first. Such maintenance shall be performed in an average of 6.25 (5 desirable) man-hours using only available organizational maintenance means and skills [MN (ED) ( $\Omega$ MR), para 11.k.].
- c. The total scheduled and unscheduled operator, organizational, and direct support maintenance shall require no more than 0.30 man-hour per hourmeter hour of operation per vehicle (power section plus work section). The approximate breakdown by various levels of maintenance is shown below. Only the overall ratio of 0.30 is a firm requirement [MN (ED) (QMR), para 11.i.(1)].
- d. Operator. Maintenance limited to cleaning, lubrication, minor adjustments, and replacement of some modular and minor components. Operator maintenance on any vehicle shall require approximately 0.03 man-hour per hourmeter hour of operation (exclusive of daily services and inspection) [MN (ED) (QMR), para 11.i.(2)].
- e. Organizational. Maintenance limited to minor adjustments of components and replacement of assemblies (e.g., remove and replace starter motor, generator assembly). Service performed on any vehicle of the family shall require no more than approximately 0.18 man-hour per hourmeter hour of operation [MN (ED) (QMR), para 11.i.(3)].

- f. Direct-Support Maintenance. Maintenance performed will include technical inspection and support assistance to units by contact teams in the repair or replacement of components, assemblies, and parts. Service performed on any vehicle of the family shall require no more than approximately 0.09 man-hour per hourmeter hour of operation [MN (ED) (QMR), para 11.i.(4)].
- g. General-Support Maintenance. Maintenance performed will reinforce the direct-support maintenance units and will accomplish major end item repair and repair of components/assemblies for return to stock. Extent of repairs will be determined by economic repair limits and stock status of replacement items. When required, general-support units provide overflow maintenance support for direct-support units [MN (ED) (QMR), para 11.i.(5)].

#### 2.8.1.3 Method

All maintenance operations required during the testing were performed by operators/mechanics in accordance with the applicable maintenance manuals, using tools normally available at the level of maintenance specified. Preventive maintenance tasks were performed at the intervals specified; corrective maintenance was limited to that required to keep the vehicle operational. All organizational and DS/GS maintenance operations were monitored to accumulate the required data; the operator's daily checks and services were observed sufficiently to obtain a representative time to perform these tasks. The computer-based automatic data processing system was used in the collection and processing of all maintenance-related reliability data. The following data were recorded:

- a. Each scheduled and unscheduled maintenance action, actual maintenance tasks performed, total man-hours expended, number of mechanics used, and total downtime in clock hours for each level of maintenance.
- b. At the time of each malfunction: identification of the failed component or assembly, the availability and cost (if known) of the failed item, the accumulated operating time (hours and miles) of the test item/system, the life (hours and miles) of the failed component, and the conditions under which the maintenance action was performed.
- c. Identification of all parts repaired or replaced by noun nomenclature, national stock number, functional group number, part number, or the manufacturer's part number.

- d. During each maintenance action: notes on the adequacy of tools and TMDE, equipment publications, and repair parts used.
- e. The time required to perform driver/crew checks and services.
- f. Who performed the maintenance: military or civilian mechanics.
- g. Reasons for any substantial differences in maintenance times for the same maintenance actions.
  - h. Vehicle operational mode at the time of malfunction.

#### 2.8.1.3.1 Analytical Method

Analytical methods and calculation procedures for quantifying M are contained in MIL-HDBK-472, "Maintainability Prediction"; MIL-STD-471, "Maintainability Demonstration"; DA Pamphlet 705-1, "Maintainability Engineer"; MIL-STD-721B, "Definition of Terms for RAM, Human Factors and Safety"; and AR 702-d, "Army RAM." All data generated during preventive and corrective maintenance operations in support of the test items during testing were entered on Maintenance Analysis and Parts Charts in accordance with the procedures of TECOM Supplement 1 to AR 750-1. The accumulated data were used to compute the following average maintainability indices for comparison to the criteria:

- a. Operator Daily Services and Inspections. These were computed separately for before- and after-operation checks and services by dividing the total time in minutes for all checks and services by the number of daily checks and services.
  - b. Frequency of Scheduled Maintenance Actions (FSMA):

FSMA = Total operating hours up to last scheduled action
Number of scheduled actions

c. Duration of Scheduled Maintenance Actions (DSMA):

DSMA = Total active maintenance time (man-hours)

Number of scheduled actions

d. Maintenance Ratio (MR). Computed for each level of maintenance, including overall MR not to include GS maintenance:

MR = Total active maintenance man-hours
Total operating test time

- e. If any of the maintainability criteria were not met using the above procedures, the maintenance operations required during testing were reviewed to determine the areas that most significantly affect overall maintainability. The following computations were also made to help define the test item maintainability characteristics:
  - (1) Achieved Availability (Aa)

Aa = Total operating test time
Total operating test time + total active
corrective maintenance (unscheduled) +
total active preventive maintenance (scheduled)

(2) Mean Time to Repair (MTTR). Computed for each level of maintenance, including overall MTTR:

MTTR = Corrective maintenance clock hours
Number of malfunctions which required
corrective maintenance

(3) Probability of Organizational Repair (P):

Number of organizational corrective maintenance tasks

- P = Total number of organizational, DS, and GS corrective maintenance tasks
- (4) Maximum Time to Repair  $(M_{max_{ct}})$ . Computed for each level of maintenance, including overall  $M_{max_{ct}}$ .

Mmaxct = Time that below which 95% of all corrective maintenance tasks are completed.

For exponential distributions of MTTR,

 $M_{\text{max}_{Ct}}$  (95%) = 3 (MTTR).

#### 2.8.1.4 Results

#### a. Breakdown of Maintenance Times

A record of failed components and assemblies and accumulated operating times of the test item and failed components at the time of failure is in Appendix D. A summary of maintenance actions follows:

#### (1) Power Section T935 (Total Hours) and Dumper T936

		Clock Hours		Man-hours	
Maint Level	Type of Maint	T935	T936	Т935	Т936
Crew	Sch	14.2	4.4	21.0	5.5
	Unsch	9.5	2.2	13.1	2.2
Org	Sch	27.2	12.1	44.2	17.5
	Unsch	77.7	12.6	126.4	16.6
DS	Sch	0	0	0	0
	Unsch	71.5	3.1	120.5	6.2
GS	Sch	0	0	0	0
	Unsch	0	0	0	0

#### (2) Power Section T935 and Dumper T942

		Clock	Hours	Man-l	nours
Maint Level	Type of Maint	T935	T942	Т935	T942
Crew	Sch	0	0.2	0	0.2
	Unsch	0.4	0.7	0.4	0.7
Org	Sch	0	0	0	0
	Unsch	22.6	2.6	28.0	2.9
DS	Sch	0	0	0	0
	Unsch	55.2	0	98.6	0
GS	Sch	0	0	0	0
	Unsch	0	0	0	0

#### (3) Power Section T959 and Dumper T960

		Clock Hours		Man-hours	
Maint Level	Type of Maint	T959	Т960	Т959	Т960
Crew	Sch	3.1	2.5	5.5	4.2
	Unsch	1.8	0.1	1.8	0.1
Org	Sch	0.9	0.7	1.8	0.7
	Unsch	13.8	2.4	9.9	18.0
DS	Sch	0	0	0	0
	Unsch	21.8	0	44.8	0
GS	Sch	0	0	0	0
	Unsch	0	0	0	0

### (4) Power Section T937 and Loader T966

Maint Level		Clock Hours		Man-hours	
	Type of Maint	T937	Т966	Т937	Т966
Crew	Sch	14.3	12.9	29.7	22.0
	Unsch	5.7	6.3	5.7	10.2
Org	Sch	21.3	3.9	38.3	6.1
	Unsch	86.5	16.3	148.1	22.8
DS	Sch	0	0	0	0
	Unsch	10.9	2.0	21.1	2.0
GS	Sch	0	0	0	0
	Unsch	0	0	0	0

### (5) Power Section T939 and Grader T940

		Clock Hours		Man-hours	
Maint Level	Type of Maint	T939	T940	Т939	T940
Crew	Sch	6.5	6.0	11.0	11.6
	Unsch	7.5	6.9	9.7	12.7
Org	Sch	17.3	1.4	24.8	2.9
	Unsch	40.6	28.7	55.6	40.9
DS	Sch	0	0	0	0
	Unsch	24.2	24.9	42.1	32.8
GS	Sch	0	0	0	0
	Unsch	0	1.0	0	1.0

### (6) Power Section T949 and Grader T950

		Clock Hours		Man-hours	
Maint Level	Type of Maint	T949	Т950	T949	Т950
Crew	Sch	0.4	1.9	0.6	2.4
	Unsch	1.0	0.3	1.2	0.3
Org	Sch	10.5	4.1	13.6	5.5
	Unsch	1.7	7.8	3.0	14.4
DS	Sch	0	0	0	0
	Unsch	9.1	8.8	12.8	8.8
GS	Sch	0	0	0	0
	Unsch	0	0	0	0

### (7) Power Section T943 and Dozer T944

		Clock	Hours	Man-hours	
Maint Level	Type of Maint	T943	T944	Т943	T944
Crew	Sch	16.6	12.2	23.5	20.4
	Unsch	1.9	4.7	2.5	7.6
Org	Sch	6.4	6.9	12.0	11.7
	Unsch	40.1	11.0	51.1	11.0
DS	Sch	0	0	0	0
	Unsch	20.5	0	41.0	0
GS	Sch	0	0	0	0
	Unsch	0	0	0	0

# (8) Power Section T955 and Scraper T956

		Clock Hours		Man-hours	
Maint Level	Type of Maint	T955	T956	Т955	Т956
Crew	Sch	3.5	4.6	7.6	10.2
	Unsch	1.3	0.5	1.3	0.8
Org	Sch	0.7	0.5	2.1	1.0
	Unsch	6.4	15.5	8.1	19.2
DS	Sch	0	0	0	0
	Unsch	20.0	11.2	51.5	19.4
GS	Sch	0	0	0	0
	Unsch	0	0.2	0	0.2

# (9) Power Section T941 and Distributor T938

		Clock	Hours	Man-l	nours
Maint Level	Type of Maint	T941	Т938	T941	T938
Crew	Sch	10.1	4.2	21.4	7.9
	Unsch	4.4	2.9	5.0	4.3
Org	Sch	9.3	2.7	12.9	4.7
	Unsch	49.3	6.1	76.8	6.0
DS	Sch	0	0	0	0
	Unsch	28.9	13.2	60.5	22.6
GS	Sch	0	0	0	0
	Unsch	0	0	0	0

# (10) Power Section T957 and Distributor T958

Maint Level		Clock Hours		Man-hours	
	Type of Maint	T957	T958	T957	Т958
Crew	Sch	1.5	0.8	3.3	1.4
	Unsch	0.9	0.1	1.1	0.1
Orq	Sch	0.7	0.3	1.2	0.6
	Unsch	0.5	1.2	0.6	2.9
DS	Sch	0	0	0	0
	Unsch	2.1	3.5	3.6	5.9
GS	Sch	0	0	0	0
	Unsch	0	2.0	0	4.0

# (11) Power Section T951 and Tamping-Foot Compactor T952

Maint Level		Clock Hours		Man-hours	
	Type of Maint	T951	T952	Т951	Т952
Crew	Sch	2.1	1.3	4.2	2.2
	Unsch	1.4	4.1	1.4	4.1
Org	Sch	4.9	1.2	6.9	2.0
3	Unsch	4.2	5.4	4.5	8.6
DS	Sch	0	0	0	0
	Unsch	0.3	0	0.3	0
GS	Sch	0	0	0	0
	Unsch	0	0	0	0

# (12) Power Section T953 and Smooth-Drum Compactor T944

		Clock	Hours	Man-1	nours
Maint Level	Type of Maint	Т953	T954	T953	Т954
Crew	Sch	2.9	1.3	5.7	2.6
	Unsch	0.4	0.7	0.4	0.7
Org	Sch	4.4	1.0	5.5	1.5
	Unsch	4.3	3.9	4.6	4.4
DS	Sch	0	0	0	0
	Unsch	7.0	1.4	7.0	1.4
GS	Sch	0	0	0	0
	Unsch	0	0	0	0

### b. Summary of Maintenance Data

(1) Test Sections T935, T936, and T942

(a) FSMA =  $\frac{913.8}{5}$  = 182.76

FSMA and DSMA values are calculated only for 250-hour scheduled maintenance.

(b) DSMA =  $\frac{61.7}{5}$  = 12.34

<u>Level</u>	MR	
Crew	0.034	
Org	0.166	
DS	0.102	
GS	0	
Overall	0.308	

- (d) Aa = 1247/(1247 + 240.4) = 0.838
- (e) MTTR by level is as follows:

Level	$\frac{\mathrm{SF}^1}{}$	UAM <sup>2</sup>
Crew	0.9	0.3
Org	1.1	1.2
DS	9.3	8.3
GS	0	0
Overall	2.0	1.5

- (f) P = 39/124 = 0.315
- (g)  $M_{\text{max}_{\text{ct}}}$  by level is as follows:

<u>Level</u>	SF	UAM
Crew	2.7	0.9
Org	3.3	3.6
DS	27.9	24.9
GS	0	0
Overall	6.0	4.5

 $<sup>^{1}</sup>$  SF — system failure

 $<sup>^{2}</sup>$  UAM — unscheduled active maintenance

# (2) Test Sections T959 and T960

(a) 
$$FSMA = \frac{371}{1} = 371$$

(b) DSMA = 
$$\frac{1.6}{1}$$
 = 1.6

Level	MR
Crew	0.031
Org	0.065
DS	0.120
GS	0
Overall	0.216

- (d) Aa = 374/(374 + 47.1) = 0.888
- (e) MTTR by level is as follows:

Level	SF	UAM
Crew	0.1	0.2
Org	0.9	1.0
DS	7.1	5.5
GS	0	0
Overall	1.9	1.2

- (f) P = 17/21 = 0.809
- (g)  $M_{\text{max}_{\text{ct}}}$  by level is as follows:

Level	SF	UAM
Crew	0.3	0.6
Org	2.7	3.0
DS	21.3	16.5
GS	0	0
Overall	5.7	3.6

# (3) Test Sections T937 and T966

(a) FSMA = 
$$\frac{924}{3}$$
 = 308

(b) DSMA = 
$$\frac{25.2}{3}$$
 = 8.4

Level	MR
Crew	0.072
Org	0.230
DS	0.025
GS	0
Overall	0.327

- (d) Aa = 936/(936 + 180.1) = 0.839
- (e) MTTR by level is as follows:

Level	SF	UAM
Crew	0.9	0.3
Org	1.2	1.6
DS	3.2	4.3
GS	0	0
Overall	1.3	1.2

- (f) P = 64/67 = 0.955
- (g)  $M_{\text{max}_{\text{ct}}}$  by level is as follows:

Level	SF	UAM
<u> </u>	==	
Crew	2.7	0.9
Org	3.6	4.8
DS	9.6	12.9
GS	0	0
Overal1	3.9	3.6

### (4) Test Sections T939 and T940

(a) FSMA = 
$$\frac{755.8}{3}$$
 = 251.9

(b) DSMA = 
$$\frac{27.7}{3}$$
 = 9.23

Level	MR	
Crew	0.058	
Org	0.160	
DS	0.097	
GS	0.001	
Overall	0.315	

- (d) Aa = 776/(776 + 245.1) = 0.760
- (e) MTTR by level is as shown:

Level	SF	UAM
Crew	1.2	0.6
Org	0.8	1.1
DS	6.1	6.1
GS	1.0	0
Overall	1.4	1.4

- (f) P = 66/74 = 0.892
- (g)  $M_{\text{max}_{\text{Ct}}}$  by level is as follows:

Level	SF	UAM
Crew	3.6	1.8
Org	2.4	3.3
DS	18.3	18.3
GS	3.0	9.0
Overall	4.2	4.2

### (5) Test Sections T949 and T950

- (a) No scheduled Organizational Maintenance was performed.
- (b) The MRs by level are as follows:

Level	MR
Crew	0.041
Org	0.332
DS	0.196
GS	0
Overall	0.569

- (c) Aa = 110/(110 + 50.5) = 0.685
- (d) MTTR by level is as follows:

Level	SF
Crew	0.117
Org	0.155
DS	2.462
GS	0
Overall	1.324

- (e) P = 6/25 = 0.240
- (f)  $M_{\text{max}_{\text{Ct}}}$  by level is as follows:

Level	SF
Crew	0.3
Org	0.6
DS	7.5
GS	0
Overal1	3.9

# (6) Test Sections T943 and T944

(a) FSMA = 
$$\frac{724.3}{3}$$
 = 241.4

(b) DSMA = 
$$\frac{20.2}{3}$$
 = 6.73

Level	MR
Crew	0.045
Org	0.163
DS	0.055
GS	0
Overall	0.263

- (d) Aa = 743/(743 + 107) = 0.874
- (e) MTTR by level is as follows:

<u>Level</u>	SF	UAM
Crew	0.1	0.4
Org	1.2	1.3
DS	6.8	20.5
GS	0	0
Overall	1.5	1.4

- (f) P = 38/39 = 0.974
- (g)  $\mathbf{M}_{\mbox{max}_{\mbox{ct}}}$  by level is as follows:

Level	SF	UAM
Crew	0.3	1.2
Org	3.6	3.9
DS	20.4	61.5
GS	0	0
Overall	4.5	4.2

## (7) Test Sections T955 and T956

(a) 
$$FSMA = \frac{221.5}{1} = 221.5$$

(b) DSMA = 
$$\frac{3.1}{1}$$
 = 3.1

<u>Level</u>	$\frac{MR}{}$
Crew	0.089
Org	0.136
DS	0.318
GS	0
Overall	0.544

- (d) Aa = 223/(223 + 64.2) = 0.776
- (e) MTTR by level is as follows:

Level	SF	<u>UAM</u>
Crew	0	0.3
Org	0.8	0.9
DS	3.8	5.2
GS	0	0
Overall	1.6	1.5

- (f) P = 24/30 = 0.8
- (g)  $M_{\text{max}_{\text{Ct}}}$  by level is as follows:

Level	SF	<u>UAM</u>
Crew	0	0.9
Org	2.4	2.7
DS	11.4	15.6
GS	0	0
Overall	4.8	4.5

### (8) Test Sections T941 and T938

(a) 
$$FSMA = \frac{777}{4} = 194.25$$

(b) DSMA = 
$$\frac{17.6}{4}$$
 = 4.4

Level	MR
Crew	0.047
Org	0.121
DS	0.100
GS	0
Overall	0.268

- (d) Aa = 830/(830 + 131.1) = 0.864
- (e) MTTR by level is as follows:

Level	SF	UAM
Crew	0.3	0.3
Org	1.3	1.6
DS	5.0	8.4
GS	0	0
Overall	1.7	1.7

- (f) P = 34/39 = 0.872
- (g)  $M_{\text{max}_{\text{ct}}}$  by level is as follows:

<u>Level</u>	SF	UAM
Crew	0.9	0.9
Org	3.9	4.8
DS	15.0	25.2
GS	0	0
Overall	5.1	5.1

# (9) Test Sections T957 and T958

(a) 
$$FSMA = \frac{194.2}{1} = 194.2$$

(b) DSMA = 
$$\frac{1.8}{1}$$
 = 1.8

Level	MR
Crew	0.025
Org	0.022
DS	0.040
GS	0.017
Overall	0.087

- (d) Aa = 237/(237 + 13.6) = 0.946
- (e) MTTR by level is as follows:

Level	SF	UAM
Crew	0	0.2
Org	0.4	0.3
DS	1.4	1.4
GS	2.0	0
Overall	1.0	0.7

- (f) P = 5/9 = 0.556
- (g)  $M_{\text{max}_{\text{Ct}}}$  by level is as follows:

SF	UAM
0	0.6
1.2	0.9
4.2	4.2
6.0	0
3.0	2.1
	0 1.2 4.2 6.0

# (10) Test Sections T951 and T952

(a) FSMA = 
$$\frac{236.3}{1}$$
 = 236.3

(b) DSMA = 
$$\frac{8.9}{1}$$
 = 8.9

Level	MR
Crew	0.041
Org :	0.075
DS	0.001
GS	0
Overall	0.117

- (d) Aa = 293/(293 + 24.9) = 0.922
- (e) MTTR by level is as follows:

Level	SF	MAU
Crew	1.9	0.9
Org	0.4	0.7
DS	0.3	0.3
GS	0	0
Overall	0.6	0.8

- (f) P = 13/14 = 0.929
- (g)  $M_{\text{max}_{\text{ct}}}$  by level is as follows:

Level	SF	UAM
Crew	5.7	2.7
Org	1.2	2.1
DS	0.9	0.9
GS	0	0
Overall	1.8	2 4

### (11) Test Sections T953 and T954

(a) FSMA = 
$$\frac{237}{1}$$
 = 237

(b) DSMA = 
$$\frac{7.0}{1}$$
 = 7.0

Level	MR
Crew	0.040
Org	0.068
DS	0.035
GS	0
Overall	0.143

- (d) A a = 237/(237 + 33.8) = 0.875
- (e) MTTR by level is as follows:

Level	SF	UAM
Crew	0.2	0.3
Org	0.5	0.6
DS	3.6	4.2
GS	0	0
Overall	0.8	0.9

- (f) P = 13/15 = 0.867
- (g)  $M_{\text{max}_{\text{ct}}}$  by level is as follows:

Level	SF	UAM
Crew	0.6	0.9
Org	1.5	1.8
DS	4.8	12.6
GS	0	0
Overall	2.4	2.7

## 2.8.1.5 Analysis

Paragraph 2.8.1.4., Results, provides summaries of maintenance times and maintenance data. Analysis of the maintenance data shows that the maintenance test criteria were not met in all cases. The scheduled (250-hour) maintenance required more than 6.25 man-hours on an average for the following vehicles:

Vehicle	Average time for 250-hour maintenance (hours)
Dumper (T935/T936/T942)	12.34
Loader (T937/T966)	8.40
Grader (T939/T940)	9.23
Dozer (T943/T944)	6.73
T.F. Compactor (T951/T952)	8.90
S.D. Compactor (T953/T954)	7.00

Those vehicles that did not accumulate 250 test hours are as follows:

	Accumulated
<u>Vehicle</u>	test hours
Grader (T959/T950)	110
Scraper (T955/T956)	233
Distributor (T957/T958)	237

The only vehicle that clearly met the scheduled criteria was the Distributor (T941/T938) with an average of 4.4 hours for four scheduled actions. The Dumper (T959/T960), Scraper (T955/T956), and Distributor (T957/T958) met the test criteria with each only having one scheduled maintenance task.

The vehicles not meeting the required overall maintenance ratio of .30 are as follows:

<u>Vehicle</u>	Overall MR	Maintenance level where MR was exceeded
Dumper (T935/T936/T942)	0.308	C/F
Loader (T937/T966)	0.327	C/O
Grader (T939/T940)	0.315	C/F
Grader (T949/T950)	0.569	C/O/F
Scraper (T955/T956)	0.544	C/F

In only two cases was the overall maintenance ratio exceeded by more than 0.027. The Grader (T949/T950)

accumulated only 110 hours at MERADCOM. If Clark's test hours and maintenance data are included, the MR for the Grader (T949/T950) reduces to 0.17. The high MR for the Scraper can be partially attributed to the rear drive problem which took 36 man-hours for repair.

Further analysis of the data (Aa, MTTR, P, and  $M_{max}_{ct}$ ), in general, shows that the MTTR and  $M_{max}_{ct}$  for Direct-Support maintenance times was the primary contributor to high MR's.

### 2.8.2 Special Tools and Test Equipment

## 2.8.2.1 Objective

- a. To identify and evaluate tools and TMDE necessary for maintenance of the vehicle.
- b. To evaluate the tools and TMDE only in areas where actual maintenance is performed.

## 2.8.2.2 Criteria

- a. (Essential) Design automotive components to be compatible with internal and external automatic test equipment (ATE) (MN(ED) (QMR), para llc).
- b. (Essential) High mortality parts that do not require component disassembly and those designed to fail when overloaded shall be <u>easily accessible</u> and rapidly replaceable by the operator using only OEM tools (MN(ED) (QMR), para 11h).
- c. (Desirable) Design of the family of equipment shall facilitate maintenance accessibility in a field environment at all categories of maintenance, so that required maintenance will be performed in the minimum practicable time with a minimum variety of tools and test equipment (MN(ED) (QMR), para 11a).

#### 2.8.2.3 Method

- a. All maintenance operations required during the testing were performed by operators/mechanics in accordance with the applicable maintenance manuals. Preventive-maintenance tasks were performed at the intervals specified; corrective maintenance was limited to that required to keep the vehicle operational. All organizational and DS/GS maintenance operations were monitored to accumulate the required data; the operator's daily checks and services were observed sufficiently to obtain a representative time to perform these tasks.
- b. Each special tool or item of the test equipment issued in support of the test item was examined. Maintenance operations for which special tools and test equipment were intended were performed as required to keep the test items operational. The special tools and test equipment not routinely used to keep the test items operational were examined visually. Where instructions were provided for the fabrication of tools and equipment, only those tools and equipment needed for actual maintenance were fabricated. Test results were used to compile a record of all special

tools and test equipment (i.e., Test, Measurement, and Diagnostic Equipment (TMDE)) which were used to perform a task. These tools and TMDE are listed in Table 2.8-1. Instructions for the tools and equipment not fabricated were reviewed and commented on. The following were investigated:

- (1) The feasibility of substituting common tools and test equipment that are already in the Army inventory for special tools and test equipment.
- (2) The essentiality of the special tools and test equipment that are furnished.
- (3) The essentiality of special tools that require fabrication.
- c. Comments pertaining to the adequacy of each special tool or TMDE to perform the intended function will be recorded.

### 2.8.2.4 Results

a. In the initial maintenance test support package, no special tools were provided. Eleven special tools were provided on 5 August. The maintenance evaluation conducted at the contractor's facility determined that the 16 special tools identified prior to the evaluation were required. Of the 16 special tools, 10 can be field fabricated according to the technical manuals.

b. As the test progressed, additional special tools (identified by "\*" in Table 2.8-1) were required to perform the necessary maintenance functions.

c. At the end of the test, 19 special tools had been required, including the 16 identified in the maintenance evaluation.

d. A  $300-lb/in^2$  gauge and a multimeter were required at the organizational level.

### 2.8.2.5 Analysis

a. The MTSP was deficient in special tools and TMDE area in that these items were not all provided for the test start.

b. The basic requirements of the test criteria of paragraph 2.8.2.2 are met. However, some tools and diagnostic equipment were required that had not been identified as essential.

Table 2.8-1. Tools and TDME

Description	NSN or Part No.	Maint Level 0 - Org F - Direct H - General	Required Yes or No
Special Tools			
Tube, expanding tool	943374	Бъ.	Yes
Wrench, spindle nut	945940	F/H	Yes
Tool - 16 Male-half assembly	2544260	н	Yes
Tool - 20 Male-half assembly	2544261	н	Yes
Socket - Special flange nut	2544746	н	Yes
Wrench - Combination, coupler header bolts	2544747	ĹL,	Yes
Driver - 0il seal hub	2544748	н	Yes
Adapter, Torque wrench	2544749	<b>[24</b>	Yes
Space - Between flange and flange retaining			
tool	2544750	н	Yes
Tube - Driver, bearing cup into hub	2544751	Н	Yes
	2544752	Н	Yes
Tube - Driver, bearing cone into internal gear	257,7,753	п	A
Tube - Driver, bearing cup into pinion bearing	551255		
cage	2544754	ж	Yes
Tube - Driver, differential bearing cones on			
case halves	2544755	н	Yes
Tube - Driver, bearing cup into hub	2544756	Н	Yes
Tube - Driver, inner pinion bearing on pinion	2544757	н	Yes
-			res
011 filter corrosion resistor wrench*			Yes
Valve stem extension device*			Yes

\* Additional special tools required.

Table 2.8-1. Tools and TMDE (Continued)

			-
		Maint Level 0 - Org	Required Yes
Description	NSN or Part No.	r - Direct H - General	No
Common Tools/TMDE			
Tool kit, general mechanics automotive	5180-00-177-7033	0	Yes
Shop equipment automotive maintenance and repair: organizational maintenance common No. 1 less power	4910-00-754-0654	0	Yes
Shop equipment automotive maintenance and repair: organizational maintenance supplement No. 1 less power	4910-00-754-0653	0	Yes
Shop equipment automotive maintenance and repair: field maintenance, basic less power	4910-00-754-0750	<b>F/</b> H	Yes
Tool kit automotive fuel and electrical system repair	4910-00-754-0655	F/H	Yes
Shop equipment, automotive maintenance and repair: field maintenance, supplement	4910-00-754-0706	F/H	Yes
300-Lb/in² gage		0	Yes
Shop equipment general-purpose repair, semitrailer-mounted	4940-00-287-4894	<b>F/</b> H	Yes

### 2.8.3 Equipment Publications

The equipment publications were evaluated for adequacy and content during all aspects of the test.

### 2.8.3.1 Objective

To determine all essential operating and maintenance functions, whether the repair parts and special tool lists are adequate, and whether the lubrication order is adequate and compatible with the PMCS.

#### 2.8.3.2 Criteria

None.

### 2.8.3.3 Method

Throughout the testing, the equipment publications provided in the maintenance test support package accompanying the test item were reviewed for accuracy and adequacy and were compared with the test item. Manual changes were reported by EPR. The publications were also compared with the regulations and military standards prescribing the format, content, and standards for military publications. The publications were checked for simplicity, clarity, and completeness; checks included:

- a. Level of operating and maintenance instructions relative to the training and skill of the operator/repairman.
- b. Simplicity, clarity, sequence, and completeness of instructions.
  - c. Adequacy of the safety instructions.
- d. Adequacy of instructions on use of tools and test equipment.
- e. Adequacy of the repair parts list, special tools list, and MAC.
  - f. Format deficiencies.

### 2.8.3.4 Results

- a. Twenty publications were required for use during test. Nineteen of these contained RPSTL's. All of these manuals were provided for test but were not identified in the MTSP list.
- b. The publications contained such discrepancies as incomplete or inaccurate lube orders, drawings, MAC's,

procedures, and RPSTL's. A summary of the adequacy of the manual is included in Table 2.8-2.

- c. Numerous changes and additions to the initial manuals, provided at the start of test, were made during the course of the test.
- d. A listing of the manuals provided for DT II is shown in Table 2.8-3.

### 2.8.3.5 Analysis

- a. MN criteria were not established for the equipment publications.
- b. The results indicate that the publications did not always reflect the equipment. However, continual ongoing changes in the manuals may have corrected many of the inadequacies noted during the test.

Table 2.8-2. Adequacy of Equipment Publications

			Adequacy of Publication When Compared With Test Item and Applicable Specifications	Com Com	Adequacy of en Compared Applicable	Adequacy of Publication When Compared With Test Item and Applicable Specifications	lica h Te	Publication With Test It Specificati	tem		
Test Item	Instruc-	ill Level	rmat	nplicity, Clarity	npleteness	cnracy	[ety		pair Parts List	stsid Ic	Comments
		SF	For	IIS	100	Aco	Sa	)AM	Kel	Tool	
Power Section	Oper	#	#	#			#				Not all repair parts are identified. Maint of air governor missing. Illus
	Maint	#	#	*	×	×	#	×	×	×	not clear. Maint of elec incomplete.
Dozer	Oper	#	#	#			**				Parts are not shown in manuals.
	Maint	#	#	#	×		#	#	×	#	
	Oper	#	#	#			#				MAC does not cover coolant hoses. Parts located differently than
Loader	Maint	#	#	#	×	×	*	#	×	#	depicted.
Dumper	Oper	#	#	#			#				Installation of activator not covered. Lube order incomplete. Adjust-
	Maint	*	#	#	×	×	**	#	×	**	procedures not covered.
	Oper	*	#	#	×		#				Does not include information for
Distributor	Maint	#	#	#	×		#	#	×	#	removing water pump.

Adequacy of Equipment Publications (Continued) Table 2.8-2.

Test Item	Instruc- tions Oper	# # Skill Level	When and A Pormat	# # Simplicity, Clarity	When Compared With Text Item  # # Simplicity, Clarity  Completeness  Accuracy  Accuracy  Accuracy  # # Safety  ##  Repair Parts List  ##	Accuracy	# # Safety ##	## Safety  MAC  MAC  MAC  MAC  MAC  MAC  MAC  MA	With Test Item  # # Safety  # MAC  Repair Parts List Ons  **	stsid looT *	Comments  Not all repair parts are identified.  Illus missing. Maint of hydrostatic drive incomplete.
	Oper Maint	# #	# #	# #	×	×	# #	#	×	*	Not all repair parts are identified. Illus of transfer case & disconnect lever incomplete.
Compactor (SD)	Oper Maint	# #	# #	# #	×		# #	#	×	#	Not all repair parts are identified. Illus missing.
Compactor (TF)	Oper Maint	# #	# #	# #	×	×	# #	#	×	#	Not all repair parts are identified. Illus missing. Incorrect procedures.

Table 2.8-3. Equipment Publications Provided for DT II

	DEP No. Or	ganizational	Support	Short Title
5-	-200-10	X		Operator's Manual
5-	-201-20&P	х		Power Section
5-	-201-34&P1		x	Power Section
5-	-201-34&P2		x	Power Section
5-	-202-20&P	X		Dozer Section
5-	-202-34&P		x	Dozer Section
5-	-203-20&P	X		Loader Section
5-	-203-34&P		x	Loader Section
5-	-204-20&P	X		Grader Section
5-	-204-34&P		x	Grader Section
5-	-205-20&P	X		Scraper Section
5-	-205-34&P		x	Scraper Section
5-	-206-20&P	X		Smooth-Drum Compactor
5-	-206-34&P		х	Smooth-Drum Compactor
5-	-207-20&P	X		Tamping-Foot Compactor
5-	-207-34&P		x	Tamping-Foot Compactor
5-	-208-20&P	Х		Dumper Section
5-	-208-34&P		х	Dumper Section
5-	-209-20&P	X		Distributor Section
5-	-209-34&P		х	Distributor Section

# 2.8.4 Repair Parts

### 2.8.4.1 Objective

To determine the technical adequacy and appropriateness of the repair parts for the test vehicles.

### 2.8.4.2 Criteria

These include:

- a. (Essential) Maximize the utilization of the module concept of maintenance to enable "repair by replacement" [MN (ED) (QMR), para 11.b.].
- b. (Desirable) Utilize only rapid-exchange (i.e., plug-in/plug-out or twist-in/twist-out) components [MN (ED) (QMR), para ll.f.].
- c. (Essential) Utilize throwaway items whenever feasible to reduce maintenance effort on expendable items [MN (ED) (QMR), para 11.h.].
- d. (Desirable) Design the family of equipment to facilitate maintenance accessibility in a field environment at all categories of maintenance so that required maintenance will be performed in the minimum practicable time with a minimum degree of skill, variety of tools, test equipment, and other supplies [MN (ED)(QMR), para ll.a.].

#### 2.8.4.3 Method

The repair parts usage was monitored throughout testing. All maintenance operations were observed, and difficulties in installation, alignment, and interchangeability of repair parts were noted. Data for repair parts included:

- a. A record of difficulties in installation, alignment, and interchangeability of repair parts.
- b. A list of repair parts that are replaceable with common parts.
- c. A list of repair parts that are replaced, by noun nomenclature, National Stock Number, and/or manufacturer's part number.
- d. A list of repair parts received but not used, and a list of the parts required but not furnished in the maintenance test package.

e. A record of repair parts listed in Draft Equipment Publications (DEP's) that are not compatible with the test item or are not prescribed at the correct maintenance level.

### 2.8.4.4 Results

A total of 41 repair parts that were required were not provided as part of the MTSP or were provided in insufficient quantities (Table 2.8-4).

# 2.8.4.5 Analysis

The criteria established were not met. Some parts were difficult to utilize and some required slight modifications. As indicated in the results, parts were not available when required for repair. The maintenance task log printout, Appendix D, identifies difficulties in installation, alignment, and interchangeability of repair parts. Also, the task log identifies repair parts that were replaced by noun nomenclature, National Stock Number, and/or manufacturer's part number.

Table 2.8-4. Components Not Available When Needed for Repair of Test Item

Item	Component
Fower Section	Control-valve solenoid Gear lever Fire extinguisher Axle stop Dip stick Alternator belt Control cable Actuator control cable Roll pin Windshield vision panel Alternator belts Fuel pump Mirror mounting bracket Mirror mounting arm assembly Emergency parking brake handle Dummy manifold Horn solenoid Windshield wiper speed control Engine coolant warning light Torque converter warning light
Grader	Hydraulic steering line Hose assembly Control cable pin Pivot bracket Pivot pin Hydraulic manifold "O" ring
Distributor	Spray head Manhole cover latches
Scraper	None
Dozer	Rod-end assembly Pivot pin Mud flap Teeth
Dumper	Master cylinder filter Control valve Pressure valve O-ring Control rod Quick-release pin Quick-release pin

Table 2.8-4. Components Not Available When Needed for Repair of Test Item (Continued)

Item	Component
Compactor (SD)	None
Loader	Bucket teeth Plunger arm
Compactor (TF)	None

### 2.8.5 Design for Maintainability

### 2.8.5.1 Objective

To determine whether the test item meets the maintainability design requirements and adheres to good maintainability design principles.

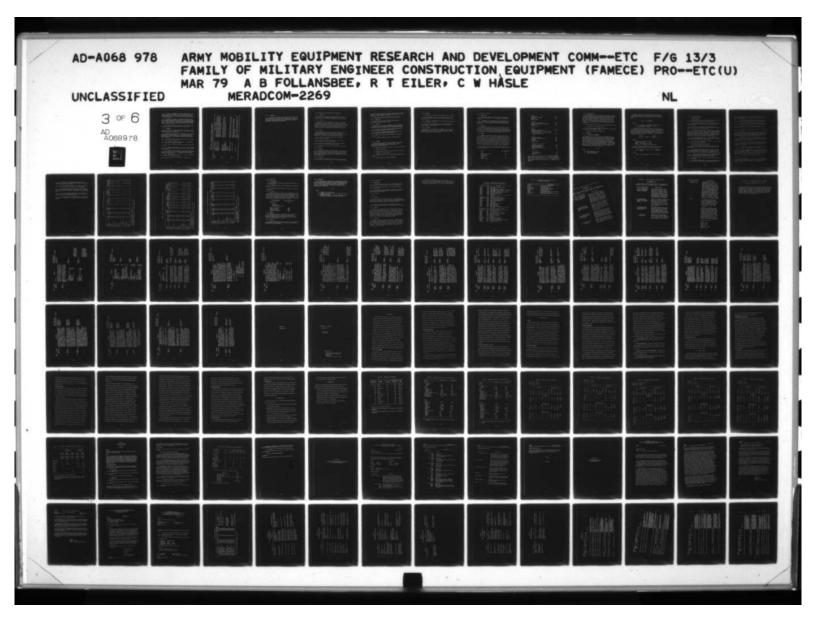
## 2.8.5.2 Criteria

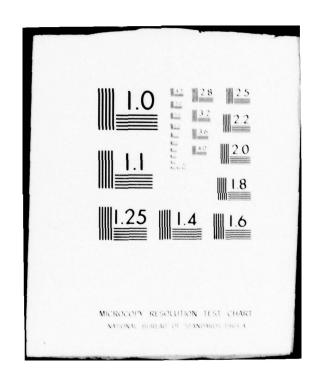
These include:

- a. (Desirable) Design the family of equipment to facilitate maintenance accessibility in a field environment at all categories of maintenance, so that the required maintenance will be performed in the minimum practicable time with a minimum degree of skill [MN (ED)(QMR), para ll.a.].
- b. (Essential) Design to prevent malfunctioning and damage to controls and linkage due to freezing, dirt, and mud accumulation [MN (ED) (QMR), para ll.e.].
- c. (Essential) High-mortality parts that do not require component disassembly and those parts designed to fail when overloaded shall be easily accessible and rapidly replaced by the operator using only OEM tools [MN (ED) (QMR, para 11.h.].
- d. (Essential) Sealed, self-lubricating, or dry-type bearings will be used in locations on equipment not accessible for lubrication. (Desirable.) Maximum use will be made of these devices [MN (ED)(QMR, para ll.d.].
- e. (Essential) Engine accessories such as starter motor, generators, injector pump, fuel pump, turbocharger and similar items, must be easily accessible for repair and/or replacement at the organizational level [MN (ED) (QMR, para 11.1.].

#### 2.8.5.3 Method

The maintenance operations were monitored continuously to note factors pertaining to ease of maintenance. The test item was examined for adherence to good maintainability design principles. Those operator and scheduled organizational preventive maintenance services that are required during the test (for the test items and the comparison equipment) were performed. Unscheduled organizational maintenance operations, direct-support maintenance operations, and general-support maintenance operations were performed as required to keep the test items operational. These include:





- a. A record of commments on design considerations for ease of access to components and test points and the use of modular construction, simple fault-isolation indicators, and protective devices to prevent damage during maintenance of the test items.
- b. A record of comments on design considerations for ease of maintenance, maximum utilization of interchangeable and throwaway components, minimization of maintenance and supply, compatibility of maintenance operations with common tools, and easy removal of major components and individual units of the test items.
- c. A record of the time required for all services and maintenance operations performed on the test items.

### 2.8.5.4 Results

- a. A record of the time required for all services and maintenance operations performed on the test item is in the maintenance printout, Appendix D.
- b. Design characteristics and components which adversely affected maintenance operations or generated excessive maintenance or supply requirements and maintenance tasks and operations that required excessive time to perform are described below:
- (1) Power section cover retaining bolts difficult access; task requires two people.
- (2) Master cylinder on power units inaccessible; step plate must be removed for access.
- (3) Water distributor side suction hose difficult to remove.
- (4) Grader blade movement no stops; causes damages to hoses, air manifold dust cover assembly, and front drive clutch assembly.
- (5) Power and work section occasionally difficult to uncouple/couple; requires excessive time (greater than 30 minutes). (See paragraph 2.5, "ENDURANCE (PQT-G) TESTING," for further description.)
- (6) Steering valve difficult to repair and remove; access panel would expedite repair.
- (7) Vulnerability of components to damage (see Table 2.8-5).

Table 2.8-5. Vulnerability of Components to Damage When Working in Wooded Areas and Rough Terrain

Incident and Result Clearing trees and brush. Damage was result of hitting trees and stumps. (The operator could not always see the stumps in the thick brush.) The damage to the air system glad hand and drain valve resulted in the automatic setting of the brakes; vehicle had to be towed from site.	These items were damaged while working in the sanitary-fill area on post. The operator backed over a tree, and as he moved forward, the tree sprang back, hitting the vehicle.	Loading dumper in wooded area on post. Operator backed into bank, shoving fuel tank against tire.	Operator backed over boulder, knocking off the automatic drain valve. Resulted in automatic setting of the brakes.	Right rear taillight pushed in and partially filled with dirt. Vehicle was stockpiling at time of incident.
Component Affected Automatic Drain Valves Fenders Head Guard for Lights Air System Rear Glad Hands	Radiator Guard Radiator Fins Service Glad Hand Automatic Drain Valves Fuel Tank Mounting Bracket Engine Hood	Fuel Tank Engine Access Panels	Automatic Drain Valve	Taillights
Test Item Dozer	Loader		Dumper	

# 2.8.5.5 Analysis

The criteria established in paragraph 2.8.5.2 were not met. Accessibility to some parts was difficult. Design in some areas caused excessive wear of components. Table 2.8-5 identifies those vulnerable components which contributed to unnecessary maintenance actions/hours.

### 2.8.6 Safety Aspects of Maintenance Operations

### 2.8.6.1 Objective

To determine if the test item incorporates safety features that allow maintenance operations to be performed without injury to personnel or damage to the test item.

#### 2.8.6.2 Criteria

(Essential) Safety engineering criteria. The family of equipment will be designed in accordance with safety engineering principles to provide the maximum degree of safety to operator, maintenance personnel, and equipment during all phases of development, test, and field utilization. The appropriate safety engineering requirements of AR 385-16 and MIL-STD-882 are applicable [MN (ED)(QMR), para 12.b.].

### 2.8.6.3 Method

The safety aspects of all maintenance functions performed throughout the test were observed. Safety inspections were performed and the findings recorded. These inspections to check for the required guards and the adequacy of warning and instruction plates included:

- a. A record of comments on the lack of adequate or inoperable safety features.
- b. A record of notes of inadequate and/or poorly located warning and instruction plates.
- c. A record of any hazardous conditions encountered while performing required maintenance actions.
- d. A record of the use of toxic materials for service or maintenance.

#### 2.8.6.4 Results

The only safety aspect of the maintenance operations was ease with which the hood brace can be bumped, releasing the hood. The hood fell on a mechanic during a repair function. A later modification by the contractor attempted to correct this, however, the effectiveness of the modification was not proved conclusively.

## 2.8.6.5 Analysis

The criteria established in paragraph 2.8.6.2 were met with the exception of the hood brace. The hood brace should

be designed so as to make repair under the hood safer. Paragraph 2.6, "SAFETY ANALYSIS," contains additional information concerning safety aspects in general.

### 2.8.7 Human Factors Aspects of Maintenance Operations

## 2.8.7.1 Objective

To determine the degree of compatibility between maintenance personnel and test item.

## 2.8.7.2 Criteria

(Essential) The family of equipment shall be designed in accordance with sound human factors, sound engineering principles, and in conformity with the following standards:

- a. MIL-STD-1472A, "Human Engineering Requirements for Military Systems, Equipment and Facilities."
- b. MIL-H-46855, "Human Engineering Requirements for Military Systems, Equipment and Facilities."
- c. USAHEL STD S-6-66, "Design Standards for Wheeled Vehicles."
  - d. MIL-STD-1474, "Noise Limits for Army Materiel."

### 2.8.7.3 Method

Repairmen were observed and interviewed to obtain the bulk of the required data. Any data lending itself to quantitative measurement were also obtained. The accumulated data consisted of:

- a. Adequacy of hoisting, lifting, and towing facilities.
- b. Ease of operations.
- c. Physical effort required for performance of duties.
- d. Adequacy of working space.
- e. Simplicity in servicing and performing maintenance duties.
  - f. Effects of engine fumes on mechanics.

# 2.8.7.4 Results

The human factor aspects of maintenance were as follows:

- a. Hose assembly difficult to remove because of hose thickness, stiffness, and resistance to bend; requires two men to install.
- b. Control rod excessive force required to move through point of component actuation.
- c. Grease gun very difficult for one individual to use; difficult to hold the extension on the fitting and apply pressure to the trigger.

### 2.8.7.5 Analysis

The human factor aspects of maintenance met the criteria of paragraphs 2.8.7.2.a through d. However, those items identified in paragraph 2.8.7.4 represent areas for improvements in human factor considerations.

#### 2.9 RELIABILITY ANALYSIS

### 2.9.1 Objectives

a. To estimate mission and system MTBF of the power section, the work sections, and the combined power-and-work sections.

b. To present point estimates and 80% confidence intervals of the mission and system reliability for each power section, work section, and for the combined power-and-work sections.

#### 2.9.2 Criteria

The FAMECE system shall have a minimum acceptable value (MAV) of MTBF comparable to existing military construction equipment. Current estimates of MAV and best operational capability (BOC) are 55 and 95 hours, respectively [MN (ED) (QMR, para 9. .(18)(a),(b)]. The typical mission duration for any member of the family will be 10 hours [MN (ED) (QMR), para 2.b.(1)].

#### 2.9.3 Method

The FAMECE was tested in accordance with Appendices III to X of the PQT-G Test Plan, dated 25 October 1977. Scoring conferences were held at intervals throughout the testing period at which time incidents were scored against the FAMECE failure definition (see Appendix XV, PQT-G Test Plan). Equipment Performance Reports (EPRs) considered in this report FB-1 through FB-1118 from PQT-G testing from 29 July 1977 to 17 March 1978. Approximately 1200 hours of similar endurance testing performed by CEC is not included. All failures are included in this analysis regardless of whether or not they resulted in modifications or corrections to the equipment.

The vehicles were tested in various modes of operation in accordance with the mission profile in MN (ED)(QMR), paragraph 2.b.(2) as follows:

Item	Task Percentage
Dozer	(%)
Earthmoving (dozing)	60
Stockpiling	15
Push loading	5
Towing	5
Travel	10
Miscellaneous	5

Loader	
Stockpiling Earthmoving (loading) Travel	20 65 10
Miscellaneous	5
Scraper	
Earthmoving (scraping) Hauling (construction materials)	80
Travel Miscellaneous	10
Dumper	
Towing Earthmoving (hauling)	5 50
Hauling (construction materials and general cargo)	30
Travel (including transporting squad personnel and tools)	15
personner una cocre,	13
Grader	
Road maintenance Spreading and leveling fill	50 20
Ditching	10
Travel	10
Miscellaneous	10
Compactors (T.F. and S.D.)	
Embankment compaction	30
Base course compaction Asphalt compaction	10
Vibratory mode compaction	20 10
Travel	10
Distributor	
Hauling water	35 55
Distributing water Travel	10

This mission profile was followed as closely as possible during testing, but because of environmental conditions, safety, etc., slight deviations (e.g., water spraying operations during periods of freezing temperatures) were made. Exceptions are outlined in paragraph 2.5, "ENDURANCE (PQT-G) TESTING."

## 2.9.4 Data Collection

Data collectors at the testing sites maintained logbooks of all incidents, maintenance performed, and other relevant information related to each vehicle during testing. Data from these logbooks were then used to generate EPRs and Maintenance Task Logs (MTLs). The EPRs were used by the scoring conferees to assess incidents against the scoring criteria. The MTLs were added to a computer file to create a data base of all maintenance actions performed on the vehicles.

The following data were required for reliability analysis:

- a. A record of all incidents (EPRs).
- b. The testing agencies scoring determination including mission criticality factors (MCFs).
  - c. Operating hours for each section

### 2.9.5 Analysis

### 2.9.5.1 Reliability Parameters

Tables 2.9-1, 2.9-2, and 2.9-3 show the FAMECE failure data compared with three calculated reliability parameters: MTBF, reliability for a 10-hour mission, and 80% confidence intervals for the MTBF and reliability. As shown in the tables, three of the vehicles were tested an insufficient number of hours to give an adequate sampling. Failure data are divided into three groups: system failures, mission failures, and mission failures with MCFs applied. Each of these groups is arranged by power section, work section, and combined vehicles. A point estimate of MTBF is calculated for each piece of failure data as follows:

 $PE = \frac{T}{R}$ 

Where:

PE = Point estimate of MTBF T = Total operating time R = Number of failures Assuming that the time between failures follows the exponential distribution, point estimates of reliability for a 10-hour mission can be obtained using the calculated MTBF's:

$$R(10) = \exp - \frac{1}{MTBF} (T)$$

Where:

The MTBF's and reliabilities calculated previously are only point estimates of the true values for these parameters. Eighty percent confidence intervals have been calculated for the mission MTBF's and mission reliabilities. These are intervals which have an 80% probability of containing the true MTBF or reliability. The 80% confidence interval for MTBF is calculated as follows:

$$\frac{2r \text{ MTBF}_p}{(x^2.1, 2r)} \leq \text{ MTBF}_r \leq \frac{2r \text{ MTBF}_p}{(x^2.9, 2r)}$$

Where:

r = Number of mission failures  $\text{MTBF}_R$  = Real MTBF  $\text{MTBF}_p$  = Point estimate of MTBF  $(x^2.1, 2r)$  = Value from  $x^2$  distribution

A similar formula is used to obtain the 80% confidence interval for the reliability for a 10-hour mission:

$$\exp \frac{-5 (X^2.1, 2r)}{r \text{ MTBF}_p} \le R(10) \le \exp \frac{-5 (X^2.9, 2r)}{r \text{ MTBF}_p}$$

Where:

R(10) = True reliability for a 10-hour mission

### 2.9.5.2 Pattern Failures

### a. Power Sections

The following pattern failures were observed on most of the power sections throughout the test period:

- (1) Dolly wheels drifting down. This was a problem until a gate valve was installed in the wheel hydraulic actuating system.
- (2) Coupler ring seating. During operations, fine particles of dust and small stones became wedged in the ring, making uncoupling and coupling difficult.
- (3) Transmission solenoid. A solenoid, part number 236402, used to control the transmission failed several times, leaving the vehicle immobile. Apparently, moisture inside the solenoid caused it to short circuit. An improved solenoid with a better seal was installed as each old one failed. Because they were not all replaced at the same time, it is difficult to determine if the new parts are adequate.
- (4) Steering control valve. Several valves leaked hydraulic oil on the operator's feet. A CEC seal kit apparently solved the problem as valves failed.
- (5) Fuel pump. Fuel pumps with cracks in the housings were replaced on several sections.

### b. Work Sections with Power Sections

The following pattern failures were observed on the work sections and associated power sections during the testing period:

(1) Dumpers (T936, T960, T942). The quick-release pin on the tailgate often vibrated loose and fell out. The pin was replaced with a nut and bolt as a temporary "fix." At this time, the fix is considered a permanent modification.

The jam nut on the parking brake came loose twice on T936. There were three instances of the parking brake being out of adjustment on vehicles T936 and T960.

- (2) Loader (T966). The bucket control rod broke on three occasions.
- (3) Graders (T940, T950). A serious problem exists on the graders; the moldboard damaged surrounding parts on

many occasions because the operators could not see it. Air hoses, disconnet levers, air manifolds, and transfer case covers were damaged.

The service brakes were locking and dragging. Modifications and fixes were made but have not been proved.

There were numerous problems with hydraulic leaks on the graders involving hoses, fittings, and manifolds.

There were two instances on T940 of the rear axle stop breaking at the weld, causing the grader to tilt to the left.

There were two instances on T940 of the moldboard developing a crack.

- (4) Distributors (T938, T958). There were no apparent pattern failures with the distributor work sections. On associated power section T941, there were three cases of the parking brake coming out of adjustment and two cases of the fan-hub adjusting-screw breaking or becoming loose.
- (5) Dozers (T944, T946). There were two failures of the adjustable tilt link on T944. One involved the thread rod bending; the other involved the adjustable tilt link unwinding, thus damaging the bushings.

There were two incidents where the mechanics inadvertently switched two air hoses on the midmount pnematic actuator. The manual does not indicate where each hose is supposed to be placed.

Failures were charged twice to T944 when the end bits were worn and no replacements were available.

(6) Scrapers (T948, T956). Nine out of 31 system failures for scraper T948 can be attributed to problems with the hydraulic drive system. There were instances where hoses and cap screws vibrated loose causing leaks, and one instance where the pump actuator adjustment screw vibrated loose causing the loss of power to the scraper wheels.

The ejector roller mount weld failed on two occasions.

(7) T.F. Compactor (T951, T952). The power section used with T951 had hydraulic leaks in the area of the bypass valve. There were three failures of a section of flared tubing and three failures of a hose on the valve.

There were occasions when the plates on the cleaner bars came off. Apparently, the plates vibrate loose and the tamping feet knock them off.

(8) S.D. Compactor (T954). The straps on the drum leaf springs failed at their welds on three occasions.

There were two instances of cap screws coming loose around the drum assembly. Apparently, this is caused by vibrations when the vehicle is operating in the vibratory mode.

The tire scraper blade locking arm broke off on two occasions. The locking arm has too much free play and bounces out of the "disengage" position.

Pattern and single-incident failures are discussed in detail in Appendix C, arranaged as major and minor incidents.

Table 2.9-1. Vehicle System/Mission Failures

			MERADOM				F	Failures	S			
Vehicle	Power	Work	Test		System			Mission		Miss	Mission w/MCF	MCF
Type	Section	Section	Hours	P.S.	W.S.	Veh.	P.S.	W.S.	Veh.	P.S.	W.S.	Veh.
Dumper I	T935	T936	1047	84	12	09	18	3	21	18	2.5	20.5
Loader	T937	1966	936	54	19	73	21	1	28	20.5	5.5	26
Grader I	T939	T940	776	38	35	73	13	15	28	11.5	14.5	26
Distributor I	1941	T938	830	41	7	84	13	4	17	13	3	16
Dozer I	T943	T944	743	28	13	41	11	9	17	11	9	17
Dozer II	T945	T946	0	*	*	*	*	*	*	*	*	**
Scraper I	T947	T948	0	*	*	* *	*	*	*	*	*	*
Grader II	T949	T950	110	5	9	11	2	4	9	2	4	9
T.F. Compactor	T951	T952	293	13	6	22	2	1	3	2	1	3
S.D. Compactor	T953	T954	273	2	14	19	3	1	4	8	0.5	3.5
Scraper II	T955	T956	230	16	14	30	2	9	11	2	5.5	10.5
Distributor II	T957	T958	237	4	2	6	3	4	7	3	3.5	6.5
Dumper II	T959	T960	374	14	3	17	2	1	9	2	0.5	5.5
Dumper III	T935	T942	200	18	2	20	4	1	2	3.5	0.5	4

MCF - Mission Criticality Factors
P.S. - Power Section; W.S. - Work Section; Veh. - Vehicle
\* Not tested at MERADCOM.

\*\* Insufficient hours to perform a meaningful assessment.

Table 2.9-2. Vehicle System/Mission Reliability

Vehicle S Type S Dumper I			MERADCOM		Relia	Reliability	(10 Hours)	urs)		80% C	80% Contidence Intervals
	Power	Work	Test		System		-	Mission w/MCF	MCF	Mission	Mission
Dumper I	eccion	Section	nours	P.S.	W.S.	Veh.	P.S.	W.S.	Veh.	MTBF	Reliability
	T935	T936	1047	0.63	0.89	0.56	0.84	0.98	0.82	40 - 70	0.78-0.87
Loader	T937	1966	936	0.56	0.81	97.0	08.0	0.94	0.76	29 - 47	0.71-0.81
Grader I	T939	T940	176	0.61	0.63	0.40	0.86	0.83	0.72	24 - 40	0.66-0.78
Distributor I	T941	T938	830	0.61	0.92	0.56	98.0	96.0	0.83	39 - 75	0.77 - 0.87
Dozer I	T943	T944	743	0.69	0.84	0.57	0.86	0.92	0.80	33 - 62	0.74 - 0.85
Dozer II	T945	1946	0 *	*	*	*	*	*	*	*	*
Scraper 1	T947	T948	0 *	*	*	*	*	*	*	*	*
Grader II	1949	T950	110	*	*	*	*	*	*	*	*
T.F. Compacter	1951	T952	293	0.65	0.74	97.0	0.93	0.97	0.90	55 - 267	0.83-0.96
S.D. Compactor	T953	T954	273	0.84	0.61	67.0	06.0	0.98	0.88	45 - 193	0.80 - 0.95
Scraper II	T955	T956	230	0.49	0.54	0.29	08.0	0.79	0.63	16 - 35	0.53-0.75
Distributor II	T957	T958	237	0.84	0.81	0.68	0.88	0.86	92.0	24 - 66	0.65-0.86
Dumper II	T959	T960	374	69.0	0.92	0.63	0.88	66.0	98.0	43 - 134	0.79-0.93
Dumper III	T935	T942	200	0.40	06.0	0.37	0.84	0.98	0.82	30 - 115	0.72-0.92

MCF - Mission Criticality Factors
P.S. - Power Section; W.S. - Work Section; Veh. - Vehicle
\* Not tested at MERADCOM.

\*\* Insufficient hours to perform a meaningful assessment.

Table 2.9-3. Vehicle System/Mission MTBF

			MERADCOM			M	MTBF		
Vehicle	Power	Work	Test		System		Mis	Mission w/MCF	MCF
Type	Section	Section	Hours	P.S.	W.S.	Veh.	P.S.	W.S.	Veh.
Dumper I	T935	T936	1047	22	87	17	58	419	51
Loader	T937	T966	936	17	65	13	94	170	36
Grader I	T939	T940	776	20	22	11	19	54	30
Distributor I	T941	T938	830	20	119	17	99	277	52
Dozer I	T943	T944	743	27	57	18	89	124	77
Dozer II	T945	T946	0 *	*	*	*	* *	* *	*
Scraper I	T947	T948	0 *	*	*	*	*	* *	*
Grader II	T949	T950	110	*	*	*	*	*	*
T.F. Compactor	T951	T952	293	23	33	13	146	293	86
S.D. Compactor	T953	T954	273	55	20	14	91	979	78
Scraper II	T955	T956	230	14	16	œ	97	42	22
Distributor II	T957	T958	237	59	47	26	79	89	36
Dumper II	T959	T960	374	27	125	22	75	248	89
Dumper III	T935	T942	200	11	100	10	57	400	20

MCF - Mission Criticality Factors
P.S. - Power Section; W.S. - Work Section; Veh. - Vehicle
\* Not tested at MERADCOM.
\*\* Insufficient hours to perform a meaningful assessment.

#### 2.10 DURABILITY

### 2.10.1 Objectives

- a. To determine if there are durability deficiencies on the FAMECE system.
- b. To demonstrate the specific durability of each major component.
- c. To demonstrate the adequacy of changes to the major components.

#### 2.10.2 Criteria

A durability failure is defined as any malfunction that prevents the item from performing its prescribed function as a result of wear and which requires repair, overhaul, or rebuild at General-Support or higher level maintenance. Each of the major component groups listed below shall have a 50% probability of completing the hours of operation specifified in the Test Plan without a durability failure:

Major Component	Hours of Operation
Power train	1250
Engine Transmission Differential and ax	:le
Coupling mechanism	1000
Hydraulic motors	1000
Hydraulic pumps	1000
Hydraulic cylinders	1000

### 2.10.3 Method

The FAMECE was tested in accordance with Appendices III to X of the PQT-G Test Plan, dated 25 October 1977. A scoring conference was to determine which failures were durability failures based on a record of all failures and the total operating time (in hours).

### 2.10.4 Results

To date, the durability failures have not been identified by the FAMECE scoring conferees; therefore, the durability parameters are not presented.

# 2.10.5 Analysis

Once the durability information is provided, five calculations will be performed, one for each major component group. If the probability of completion is equal to or greater than 50% for a given group, that group meets the durability criteria. The probability of each major component meeting the specified criteria is:

 $P = 1 - \frac{X}{N}$ 

#### Where:

P = Probability of completion.

X = Number of components within the specified time for a component group.

N = Number of failures in the given component group that have operated for the specified time.

### 2.11 FINAL INSPECTION

# 2.11.1 Objectives

- a. To determine if any defects were caused during prior tests and were not detected before the final inspection.
- b. To prepare the test items to the required shipping code before shipment.
- c. To conduct a limited teardown inspection, as required, in those areas where test operation indicates a need for a more detailed investigation.

# 2.11.2 Criteria

None.

# 2.11.3 Method

Each test item was inspected against: the checklists provided in the Operator's and Organizational Maintenance Manual, the inspection checklist provided in PQT-G, and EPRs and various data generated and logged during the testing program.

Teardown was conducted only where scheduled service, repair to serviceable condition, or modification was dictated.

# 2.11.4 Results

Modifications and necessary repairs were made to restore test items to serviceable condition. (Serviceable condition meaning that detected seeps, cracks, and similar conditions would not worsen prior to the next scheduled maintenance or the end of the total test including OT.) In some instances, detected defects could not be corrected because spare parts were not available. Time did not permit teardown solely for inspection. Further, this would have interfered with the collection of reliability and maintenance data.

# 2.11.5 Analysis

Although the test items were inspected at MERADCOM prior to shipment to the Fort Bragg (OT) test site, many reportable EPR incidents and maintenance actions occurred as a result of the inspection and interpretation of serviceable condition prior to the operational test conducted at Fort Bragg by OTEA personnel. These incidents were collected, reported, and scored as part of the PQT-G.

FAMECE Engineer Change Notices accomplished prior to the start of OT II are shown in Table 2.11-1. The majority of these changes or modifications were made after the PQT was terminated. Engineer Change Notices not assigned numbers are shown in Table 2.11-2.

Table 2.11-1. FAMECE Engineer Change Notices Accomplished Prior to the Start of OT II

Section	FCN No.	Description
Power	1303	Transmission neutral solenoid
Power	1369	Hood latch
Power	1396	Fuel tank mounting bracket
Power	1417	Electromagnetic interference suppressors
Power	1445	Dolly-wheel cylinder hose
Power	1455	Dolly-wheel cylinder valve, shutoff
Power	1488	Lock plate modification
Power	1514	Battery cable rerouted
Dozer	1525	Tilt link
Power	1540	Transmission dipstick pipe (Dozers PS 10 & 109)
Dozer	1559	Winch cable guide
TF Compactor	1563	Tamping-foot drum cleaners
Compactors	1567	Dirt shield, drum lift switch
Power	1578	Air throttle modification
Dozer	1587	Winch assembly modification
Scraper	1596	Storage for propshaft
Power	1599	Rifle mount
Power	1602	Cab mirrors
Power	1613	Compressor outlet hose
Scraper	1614	Pump propshaft
Power	1617	Throttle linkage
Power	1618	Rotate speed limiter
Power	1628	Tachometer drive (deferred on PS 104, 105 & 106)
SD Compactor	1629	Add locks, cut hole in strut
Power	1638	High-inertia flywheel (PS 106 & 108)
SD Compactor	1639	Tire cleaner lock
Grader	1660	Lift cylinder mounting bolt
Grader	1666	Convex mirrors
Loader	1672	Boom locking bar pin alignment
Power	1682	Remove bottom rung of ladder
Grader	1696	Grader axle stops
Dumper	1712T	Dumping tailgate pin
Power	1717	Relay box
Scraper	1743	Magnetic drain plug
Distributor	1751T	Sight gauge, water level
Power	1755	Air tank drain petcock
Scraper	1760	Control box & propshaft mounting kit
Scraper	1761	Hydrostatic drive filter
Scraper	1762	Pressure switch

Table 2.11-2. FAMECE Engineer Change Notices (Numbers Not Assigned)

Section	Description
Grader	Drive-shaft disconnect
Grader	Side-shift nut
Distributor	Drain for spray bar
TF Compactor	TF vibrator hood support
Power	Grease coupler
Scraper	Scraper-bowl lock
Power	Fuel pump housing (as leaks occur)
SD Compactor	Water-level switch
Grader	Grommet for steer tube (102 only)

CRITICAL ISSUES AND TEST CRITERIA

Those issues extracted from the AMSAA, the MERADCOM POT-G. the were tested for, or observed during,

Test Critical Issues

Does the FAMECE meet mission established RAMD requirements?

lated mission tasks. MTBF required for satisfactory per required is 55 hours. formance is 55 hours. now and is this figure justified. It is this rigure is arbitrary and is has not been justified. defendanticipated that a more loped anticipated will be developed able value will school and pm by the Engineer School and pm by the Engineer School and PM before this test is finished.

Has satisfactory progress been made toward the required MAV?

Input to reliability growth curve (namely, all failure history) and data from vp-retest com-c (namely, all rallure nistory)
and data from VP-retest CM-IT. and data from VP-retest EDT-C, EDT-G, POT, DT-II, and Slope all corrective actions. of curve must be such that proor curve must pe such that projected MTBF after DT-III is 55 hours or more.

Does FAMECE performance meet mission requirements? 3.

The FAMECE derives several advantages in terms of production rate and cost from its use much rate and cost from its use of Much the two-module concept. be lost of this advantage will be found in and uncounting time if counting and uncounting time. or this advantage will be lost times if coupling and uncoupling in minutes cannot be held under 30 minutes cannot be held under 30 minutes.

Coupling and uncoupling.

Time required to bring both modules into coupling position modules into coupling position

(i.e., travel time for uncoupling power module) will be reported to coupling time. power module) will be reported to coupling time.

### APPENDIX A. CRITICAL ISSUES AND TEST CRITERIA

# Part I (from AMSAA, TDP)

Those issues extracted from the AMSAA, TDP, Appendix C, which were tested for, or observed during, the MERADCOM PQT-G.

# Test Critical Issues

# Test Criteria

- 1. Does the FAMECE meet mission established RAMD requirements?
- RAMD data obtained from simulated mission tasks. MTBF required for satisfactory performance is 55 hours. However, this figure is arbitrary and has not been justified. It is anticipated that a more defendable value will be developed by the Engineer School and PM before this test is finished.
- 2. Has satisfactory progress been made toward the required MAV?
- Input to reliability growth curve (namely, all failure history) and data from VP-retest EDT-C, EDT-G, PQT, DT-II, and OT-II; all corrective actions. Slope of curve must be such that projected MTBF after DT-III is 55 hours or more.
- 3. Does FAMECE performance meet mission requirements?
- The FAMECE derives several advantages in terms of production rate and cost from its use of the two-module concept. Much of this advantage will be lost if coupling and uncoupling times cannot be held under 30 minutes.
- Coupling and uncoupling.
- Time required to bring both modules into coupling position (i.e., travel time for uncoupling power module) will be reported but not added to coupling time.

# Test Critical Issues

# Mobility in adverse terrain.

# c. Safety

# Test Criteria

The FAMECE must perform its mission tasks off-road. It must get to the work site and develop high tractive efforts under uneven terrains and soft soil conditions. There is some question concerning how mobile the uncoupled power module must be. If full advantage is to be taken of the commonality of the power module, it must be capable of moving from an idle work module to another location where another work module is inoperative because its power module is disabled. This capability is critical to the justification of the FAMECE concept.

It is obvious that a vehicle or family of vehicles that will be transported by air and operated in hazardous terrain in the immediate vicinity of other vehicles must be made as safe as the state-of-the-art allows.

Personnel possessing nominal skill levels of construction equipment operators and maintenance personnel must be able to perform required functions without incurring any abnormal hazards such as exposed moving parts, dangerous noise levels, and vehicle instability. Tests involve examination of vehicle construction and operation as well as observation of personnel engaged in required operations.

Operator MOS's are:

Scraper - 62L. Grader - 63K. Loader - 62M. Dozer 62L. Distributor - 62J. Compactor - 62J. Dumper - 64C.

# APPENDIX A. CRITICAL ISSUES AND TEST CRITERIA

Part II (from PQT-G Test Plan, October 1977)

This appendix is a cross index between the material need criteria and the PQT tests that will generate data to validate the criteria. The criteria are the basic requirement from which the detail test plans for the various work sections are created. Certain criteria are addressed in the contractor-performed RDAT or EDT and will not be repeated in the PQT. However, adherence or exceptions to these criteria will be noted and recorded throughout the PQT.

Sub- PQT-G Plan Remarks	٨,			Includes clearing, grubbing, towing, winching, scarify-ing, & ditching.		Excavating, clamshell, rough grading, backfilling, mounting and dismounting counterweights.
Applicable Sub- test from PQT-G Detail Test Plan	Reliability, para 2.9			Appendix IV		T KIDDON TO THE TOTAL THE TOTAL TO THE TOTAL THE TOTAL TO THE TOTAL TH
Criteria	Mission.  (1) The typical mission duration for any member of the family will be 10 hours. The average yearly usage envisioned for any member of the family will be 1000 hourmeter hours.	A typical mission profile for each member of the family will be composed of the following construction tasks in the percentages indicated below:	a. Dozer	Earthmoving (dozing) 60% Stockpiling 15% Push loading 5% Towing Travel 10% Miscellaneous 5%	b. Loader	Stockpiling 20% Earthmoving (loading) 65% Travel 10% Miscellaneous 5%
Source	MN(ED) QMR 2.b(1)	MN(ED) QMR 2.b(2)				
Item	1.	2.				

Remarks																		
Applicable Sub- test from PQT-G Detail Test Plan	Scraper, Appendix V				Dumper, Appendix VI					Grader,	VIII					Compactors,		
		808	58 108	5%		ر د د د د د د د د د د د د د د د د د د د	\$00	30%	15%		508		20%	10%	108		100% 100% 100%	, ,
Criteria	c. Scraper	Earthmoving (scraping) Hauling (construction	materials) Travel	Miscellaneous	d. Dumper	Towing	Hauling (construction materials and general	cargo) Travel (to include trans-	porting squad personnel and tools)	e. Grader	Road maintenance	Spreading and leveling	fill Ditching	Travel	Miscellaneous	f. Compactors	Embankment compaction Base course compaction Asphalt compaction Vibratory mode compaction Travel	1)
Source	tinued)																	
Item	2. (continued)																	

Remarks				Data are recorded of hours of operation and amounts of fuel used.		Determined at initial inspection and checked continuously throughout the testing.	Determined at initial inspection and checked continuously throughout the testing.
Applicable Sub- test from PQT-G Detail Test Plan	Distributor,	TIA KIDIDAAA	Initial Inspection, para 2.2	All perform- ance subtests	Initial Inspection, para 2.2	Initial Inspection Action, para 2.2	Initial Inspection Action
Criteria	g. Distributor	Hauling water 35% Distributing water 55% Travel 10%	(Essential) Must operate utilizing standard Army fuels and lubricants.	(Essential) Have sufficient fuel capacity for at least 200 miles of travel on secondary roads or 10 hours of operation as a work tool.	(Essential) Consist of no more than two major functional components; a power module and a construction work module.	(Essential) Waterproof and dust- proof storage provisions for main- tenance log, manuals, and other instructions shall be provided on each power module and work module.	(Essential) The power module and work modules will be capable of being coupled or uncoupled at the work site within 30 minutes (15 minutes desirable) without the need for special tools or equipment.
Source	2. (continued)		MN(ED) QMR 9.a(1)	MN (ED) QMR 9.a(3)	MN (ED) QMR 9.a(7)	MN (ED) QMR 9.a(12)	MN(ED) QMR 9.a(16)
Item	2. (		ë.	4	'n	ė	7.

Remarks			
Applicable Sub- test from PQT-G Detail Test Plan	Reliability, para 2.9	Maintenance, para 2.8	
Criteria	The FAMECE system shall have a Minimum Acceptable Value (MAV) of Mean Time Between Failure (MTBF) comparable to existing military construction equipment. The current best estimates for MAV and Best Operational Capability (BOC) are 55 and 95 hours, respectively. These values will be reassessed as soon as practicable, and in any event not later than the beginning of DT II, based on a joint AMC/TRADOC study of existing comparable military construction equipment.	The FAMECE shall have an achieved availability (Aa) of 86% (based on an average number of mechanics per maintenance action of 1.8) during developmental testing as determined by the following formula:  Aa = OT	Where: OT = Operating time (hourmeter hour) ST = Standby time (assumed operable) TCM = Total active corrective maintenance (unscheduled) TPM = Total active preventive maintenance (scheduled)
Source	MN (ED) QMR 9.a (18) (b)	MN (ED) OMR 9.a (19) (b)	
Item	œ́	6	

Remarks								
Applicable Sub- test from PQT-G Detail Test Plan	Durability							
	Each of nent robability f opera- durability ilure is n that rforming s a result s repair neral-	Hours	1200		1000	1000	1000	1000
Criteria	the following major component groups shall have a 50% probability of completing the hours of operation specified without a durability failure. A durability failure is defined as any malfunction that prevents the item from performing its prescribed function as a result of wear and which requires repair overhaul or rebuild at General-Support or higher level maintenance.	Major Component Groups	<pre>a. Power trains (consisting of):</pre>	Engine Transmission Differential and axle	b. Coupling mechanism	c. Hydraulic motors	d. Hydraulic pumps	e. Hydraulic cylinders
Source	MN (ED) QMR 9.a(20)							
Item	10.							

ub- I-G lan Remarks	Installation of counterweight will not cause the weight of module to which it is attached to exceed 15,000 lb will not be tested.		This characteristic is tested in EDT. Vehicle stability will be observed through the testing.
le S m PQ sst P	IV	VI	14
Applicable Sub- test from PQT-G Detail Test Plan	Dozer, Appendíx IV	Dozer, Appendix	Dozer, Appendix IV
Criteria	(Essential) Have a dozing capability of 80 loose cubic yards per hour while excavating a 100-foot slot trench in undisturbed sandy, clay soil at no greater than optimum moisture content. Have a dozing capability, when counterweighed, of 110 loose cubic yards per hour while excavating a 100-foot slot trench in undisturbed sandy, clay soil at no greater than optimum moisture content. (Desirable) Installation of counterweight will not cause the weight of the module to which it is attached to exceed 15,000 pounds.	(Essential) Semi-U dozer with backrip scarifier teeth or comparable type blade shall be capable of tilt adjustment to at least 10 inches in each direction when measured from one blade to the other blade curner and a manual pitch adjustment of at least 9 degrees. The blade shall be capable of push-loading	(Essential) Be capable of climbing and descending longitudinal slopes of 60% and side slopes of 35%.
Source	MN (ED) QMR 9.b (1) (c)	MN(ED) QMR 9.b (1)(e)	MN(ED) QMR 9.b (1)(f)
Item	11.	12.	13.

PQT-G  PQT-G  This characteristic  II is tested in EDT. Vehicle stability will be observed throughout the testing.	This characteristic is tested in EDT. Vehicle stability will be observed throughout the	testing. This criteria will be validated commensurate with test area capability.	The scraper control system will be checked at initial inspection and evaluated throughout the entire testing.
Applicable Subtest from PQT-GDetail Test Plan Loader, Thi Appendix III is vel will	Loader, Appendix Il	Scraper, Appendix V	Initial Inspection, para 2.2
(Essential) Have a loader capacity, with a multisegment bucket of at least 2-1/2 cubic yards capacity, of not less than 250 cubic yards per hour when loading from a stockpile of loose sandy, clay soil. Consistent with good vehicle design practice, a larger capacity bucket is desired.	(Essential) Be capable of climbing and descending longitudinal slopes of 60% and negotiating side slopes of 27% when empty.	(Essential) Be capable, when loaded to a GVW of at least 50,000 pounds, of attaining and maintaining a forward speed of at least 20 mph when ascending a 2.5% slope on a hard, smooth surface with a vehicle rolling resistance of 40 pounds per ton.	(Essential) The scraper control system shall provide:  a. Power closing of apron.  b. Power down pressure on the cutting edge.
Source MN(ED) QMR 9.b (2)(c)	MN(ED) OMR 9.b	MN (ED) QMR 9.b (3) (a)	MN (ED) QMR 9.b (3) (b)
Item 14.	15.	16.	17.

Sub- 2T-G lan Remarks			Validated during RDAT or EDT. Functional capa- bility observed during PQT.	Validated during RDAT or EDT. Scraper stability will be observed during PQT.	Underlined portion of criteria is a contractual, not an MN requirement, and is coordinated standard and will be validated during PQT in conjunction with dozer test.
Applicable Sub- test from PQT-G Detail Test Plan			Scraper, Appendix V	Scraper, Appendix V	Scraper, Appendix V
Criteria	<ul><li>c. Positive ejection and power return of ejector gate.</li></ul>	d. Fast drop bowl to promote pump loading.	(Essential) Have a minimum rated struck capacity of 10 cubic yards (12 cubic yards desirable).	(Essential) When loaded to rated load, be capable of climbing a 30% longitudinal slope or of descending a 60% longitudinal slope and of negotiating 20% side slopes with the bowl in the normal travel position. Be capable of negotiating 35% side slopes when empty.	(Essential) Be capable of being push-loaded by the dozer member of this family. The scraper shall be capable of loading to rated capacity in sandy, clay soil, with no greater than optimum moisture content in 40 seconds when pusher-assisted by a FAMECE dozer, In the same soil, the scraper shall be capable of self-loading to 80% of rated capacity in 60 seconds.
Source	17. (continued)		MN(ED) QMR 9.b (3)(c)	MN(ED) QMR 9.b (3)(d)	MN (ED) QMR 9.b (3) (e)
Item	17.		18.	19.	20.

Sub- 20T-6 Plan Remarks	Validated during PQT.	Validated during RDAT and EDT.	Validated during PQT.	Validated during RDAT or EDT. Lesser slopes capability observed during PQT.	Validated during RDAT or EDT.	The transporta- tion of squad personnel with tools and equip- ment will be tested during PQT.
Applicable Sub- test from PQT-G Detail Test Plan	Grader, Appendix VIII	Dumper, Appendix VI	Dumper, Appendix VI	Dumper, Appendix VI	Dumper, Appendix VI	Dumper, Appendix VI
Criteria	(Essential) Provide a side shifting 13-foot grader blade capable of assuming any normal blade position from ditching to bank cutting. (Desirable) Be capable of grading in a forward and reverse direction.	(Essential) Have a payload capability of at least 10 tons (12 tons desirable).	(Essential) Have a rear dump capability while moving forward so as to spread the hauled material. The capability to side dump as well as rear dump is desirable.	(Essential) Be capable of climbing and descending longitudinal slopes of 60% and side slopes of 20% (30% desirable) with its rated load.	(Essential) Be capable of hauling its rated load at least 20 mi/h on a hard, smooth surfaced road with rolling resistance of 40 pounds per ton and up to 2.5% slope.	(Essential) The dump bed should be configured so it may be used for general cargo hauling and for the transportation of squad personnel with tools and equipment.
Source	MN (ED) QMR 9.b (4) (c)	MN(ED) QMR 9.b (5)(a)	MN(ED) QMR 9.b (5)(c)	MN (ED) QMR 9.b (5) (e)	MN(ED) QMR 9.b (5)(f)	MN (ED) QMR 9.b (5) (9)
Item	21.	22.	23.	24.	25.	26.

ub- T-G lan Remarks	The underlined portion of criteria will be subjectively evaluated.	Validated during RDAT or EDT.	Validated through- out PQT.
Applicable Sub- test from PQT-G Detail Test Plan	Compactor, Appendix IX and X	Compactor, Appendix IX and X	Compactor, Appendix IX and X
Criteria	(Essential) Be capable of compacting without soil shear at speeds in excess of 7.5 mi/h (10 mi/h desired). The compactor shall impart impact to the soil mass when operating in excess of 1.5 mi/h.  In addition, the tamping-foot compactor shall impart beneficial vibration to the soil mass when compacting at speeds in excess of 6 mi/h.	(Essential) By smooth steel drum, capable of exerting compaction pressures of up to 150 pounds per linear inch or roller width. A vibration mechanism shall provide dynamic forces in excess of 25,000 pounds.	By pneumatic tires capable of providing unit ground pressures up to at least $100 \text{ lb/in}^2$ . Tire pressure shall be capable of being varied to provide a high production, variable pressure, pneumatic compactor for work on base and sub-bases and for teaming with tamping-foot compactors on embankment compaction work.
Source	MN (ED) QMR 9.b (6) (a) (1)	MN(ED) QMR 9.b (6)(a)(2)	MN(ED) QMR 9.b (6)(a)(3)
Item	27.	28.	29.

Item	Source	Criteria	Applicable Sub- test from PQT-G Detail Test Plan	ub- T-G lan Remarks
30.	MN (ED) QMR 9.b (6) (b)	(Essential) The compactor work modules shall be configured as a tamping-foot pneumatic-tire configuration, and as a smooth, steel drum-pneumatic tire configuration in order to be transportable without the need of a trailer.	Compactor, Appendix IX and X	Durability of compactor in transport mode.
31.	MN (ED) QMR 9.b (6) (c)	(Essential) The compactor modules shall have a controlled watering system to provide water or oil spray on the smooth drum and pneumatic tires to insure 4 hours of continuous use. Scrapers and/ or cleaner bar type devices, as appropriate, will be provided for removing excess materials from the drum, tires, and tamper feet.	Compactor, Appendix IX and X	Validated during PQT.
32.	MN(ED) QMR 9.b (6)(9)	(Desirable) Compactor modules shall incorporate a rear dump ballast box.	Initial Inspection	
33.	MN(ED) QMR 9.b (7)(g)	(Essential) Be capable of spraying water from each side and the rear using adjustable spray heads, individually controlled from the operator's station.	Initial Inspection Distributor	
34.	MN (ED) QMR 9.b (7) (b)	(Essential) Be capable of spraying water not less than 35 feet from the spray head and provide a spray pattern adjustable from 20 feet to 70 feet in width at the rear of the distributor.	Distributor	Validated during RDAT and EDT. Durability vali- dated during PQT

Item	Source	Criteria	Applicable Sub- test from PQT-G Detail Test Plan	ub- T-G lan Remarks
35.	MN(ED) QMR 9.b (7)(g)	(Essential) Shall be capable of self-loading within a period of 10 minutes.	Distributor	Validated during RDAT or EDT; spot checked during PQT.
36.	MN(ED) QMR 9.b (7)(e)	(Essential) A ladder shall be provided for access to a hinged manhole cover on top of the tank.	Initial Inspection	Validated during RDAT or EDT.
37.	MN(ED) QMR 10.d	(Essential) Be provided with adequate connections to be towed and be capable of towing standard military trailers.	Dumper Dozer	Validated during RDAT or EDT.
38	MN (ED) QMR 10.e	(Essential) Have simple, easily accessible controls for use by a single operator. Seating space for two will be provided at the operator's platform. Be designed to provide clear visibility for all types of operators.	Initial Inspection HFE Evaluation	The underlined portion of criter will be subjectively evaluated.
39.	MN(ED) QMR 10.i	(Essential) Quick disconnect fittings with attached covers shall be provided to facilitate sectionalization of all members of the family.	Initial Inspection	Criteria to be evaluated through out PQT.
40.	MN(ED) QMR 10.k	(Essential) Power modules shall be equipped with windshield protection and removable wheel fenders or mud quards as appropriate. Total module weight will not exceed 15,000 pounds with these attachments installed.	Initial Inspection	

Remarks						
Applicable Sub- test from PQT-G Detail Test Plan	Maintenance Evaluation (Repair Parts) (Design for Maintenance)	Maintenance Evaluation (Repair Parts)	Maintenance Evaluation (Tools and Test Equipment)	Maintenance Evaluation (Design for Maintenance)	Maintenance Evaluation (Design for Maintenance)	Maintenance Evaluation (Repair Parts)
Criteria	(Desirable) Design the family of equipment to facilitate maintenance accessibility in a field environment at all categories of maintenance so that required maintenance will be performed in the minimum practicable time with a minimum degree of skill, variety of tools, test equipment and other supplies.	(Essential) Maximize the utilization of the module concept of maintenance to enable "repair by replacement."	(Essential) Design automotive components to be compatible with internal and external automatic test equipment (ATE).	(Essential) Sealed, self-lubricating, or dry-type bearings will be used in locations on equipment not accessible for lubrication. (Desirable) Maximum use will be made of these devices.	(Essential) Design to prevent malfunctioning and damage to controls and linkage due to freezing, dirt, and mud accumulation.	(Desirable) Utilize only rapid exchange (i.e., plug-in/plug-out or twist-in/twist-out) components.
Source	MN (ED) QMR 11.a	MN(ED) QMR 11.b	MN (ED) QMR 11.c	MN (ED) QMR 11.d	MN(ED) QMR 11.e	MN(ED) QMR 11.f
Item	41.	42.	43.	44	45.	46.

Remarks				
Applicable Sub- test from PQT-G Detail Test Plan	Maintenance Evaluation (Repair Parts)	Maintenance Evaluation (Repair Parts) (Design for Maintenance)	Maintenance Evaluation (Maintenance Indices)	Maintenance Evaluation (Maintenance Indices)
Criteria	(Essential) Utilize throwaway items whenever feasible to reduce maintenance effort on expendable items.	(Essential) High-mortality parts that do not require component disassembly and parts designed to fail when overloaded shall be easily accessible and replaced rapidly by the operator using only OEM tools.	The total scheduled and unscheduled Operator, Organizational, and Direct Support Maintenance shall require no more than 0.30 man-hours per hourmeter hour of operation per vehicle (power modules plus work module). The approximate breakdown by various levels of maintenance is shown below. Only the overall ratio of 0.30 is a firm requirement.	Operator: Maintenance limited to cleaning, lubrication, minor adjustments, and replacement of some modular and minor components. Operator maintenance on any vehicle shall require approximately 0.03 man-hour per hourmeter hour of operation (exclusive of daily services and inspections)
Source	MN(ED) QMR 11.9	MN(ED) QMR 11.9	MN (ED) QMR 11.i(1)	MN(ED) QMR 11.i(2)
Item	47.	48.	. 49.	.05

Remarks			
Applicable Sub- test from PQT-G Detail Test Plan	Maintenance Evaluation (Maintenance Indices)	Maintenance Evaluation (Maintenance Indices)	Maintenance Evaluation (Maintenance Indices)
Criteria	Organizational: Maintenance limited to minor adjustments of components and replacement of assemblies (e.g., remove and replace starter motor, generator assembly). Service performed on any vehicle of the family shall require no more than approximately 0.18 man-hour per hourmeter hour of operation.	Direct Support Maintenance: Maintenance performed will include technical inspection and support assistance to units by contact teams in the repair or replacement of components, assemblies, and parts. Service performed on any vehicle of the family shall require no more than approximately 0.09 man-hour per hourmeter hour of operation.	General-Support Maintenance: Maintenance performed will reinforce the direct-support maintenance units and will accomplish major end-items repair and repair of components/assemblies for return to stock. Extent of repairs will be determined by economic repair limits and stock status of replacement items. When required, general-support units provide overflow maintenance support for direct-support units.
Source	MN (ED) QMR 11.i (3)	MN(ED) QMR 11.i(4)	MN(ED) QMR 11.i(5)
Item	51.	. 52.	53.

Remarks				
Applicable Sub- test from PQT-G Detail Test Plan	Maintenance Evaluation (Maintenance Indices)	Maintenance Evaluation (Maintenance Indices)	Maintenance Evaluation (Design for Maintenance)	Human Factors Engineering
Criteria	Operator Daily Services and Inspections: (Essential) Requirements for inspections must be kept to an absolute minimum. Before operation and after operation checks and services will not exceed an average of 30 minutes each.	Scheduled Maintenance: (Essential) Requirements for scheduled maintenance other than operator daily checks and services shall be established at 250 (desirable 400) hourmeter hours or quarterly, whichever occurs first. Such maintenance shall be performed in an average of 6.25 (5 desirable) man-hours using only available organizational maintenance means and skills.	(Essential) Engine accessories, i.e., starter motor, generators, injector pump, fuel pump, turbocharger and similar items, must have the characteristics of being easily accessible for repair and/or replacement at the Organizational level.	(Essential) The family of equipment shall be designed in accordance with sound human factors engineering principles and in conformity with the following standards:
Source	MN (ED) QMR 11. j	MN(ED) QMR 11.k	MN (ED) QMR 11.1	MN (ED) QMR 12.a
Item		ທີ	. 99	57.

a. MIL-STD-1472B, "Human Engineering Requirements for Military Systems, Equipment and Facilities."

Remarks						
Applicable Sub- test from PQT-G Detail Test Plan				Safety Evaluations		Human Factors Evaluation
Criteria	<ul><li>b. MIL-H-46855, "Human Engineering Requirements for Military Systems, Equipment and Facilities."</li></ul>	c. MIL-HDBK-759, "Design Standards for Wheeled Vehicles."	d. MIL-STD-1474A, "Noise Limits for Army Materiel."	(Essential) Safety Engineering Criteria: The family of equipment will be designed in accordance with safety engineering principles to provide maximum degree of safety to operator, maintenance personnel, and equipment during all phases of development, test, and field utilization.	The appropriate safety engineering requirements of AR 385-16 and MILSTD-882 are applicable.	Training Considerations: No specialized training other than current MOS training for equipment operator and equipment mechanic will be required. On-the-job training at unit level for sectionalization of this equipment will be required for both operator and maintenance personnel. Ten spaces for new equipment training for instructor personnel and a specified number of
Source	57. (continued)			MN (ED) QMR 12.b		MN (ED) QMR 15
Item	57.			. 8		

Remarks			
Applicable Sub- test from PQT-G Detail Test Plan		Human Factors Evaluation	Human Factors Evaluation
Criteria	power modules, work modules, and model components will be required 120 days in advance of initiation of Service School and Training Center training. Quantities will be specified by TRADOC during the full-scale development phase.	Operator seating must accommodate Army personnel within the range of 5th to 95th percentile.	Personnel enclosures (cabs) shall provide a working environment which is compatible with human performance characteristics with respect to vibration, ventilation, and temperature control.
Source	59. (continued)	60. MIL-STD- 1472A	MIL-STD- 1472A
Item	. 65	.09	61

APPENDIX B
TEST DATA

# REFERENCE OIL PROGRAM

FAMECE DT II

Final Report May 1978

# Submitted By:

Paul Kennedy and Thomas Bowen Energy and Water Resources Laboratory MERADCOM Fort Belvoir, Virginia 22060

#### I. INTRODUCTION

Developmental Testing (DT II) of a new Family of Lightweight Engineering Construction Equipment (FAMECE) was conducted at Fort Belvoir, Virginia. This equipment was designed to meet the highmobility and airlift/airdrop requirements of the Army Airborne and Airmobile units. In cooperation with the Project Manager's Office (PMO), FAMECE/UET, the Energy and Water Resources Laboratory participated in a cooperative program involving field testing of a reference lubricant in selected vehicles. This reference lubricant is presently in the Army supply system and is typical of the quality of lubricant that will be used in FAMECE after fielding. The Energy and Water Resources Laboratory provided this MIL-L-2104C reference oil for use in the engines, transmissions, and hydraulic systems of selected vehicles and, in addition, conducted an engine inspection and lubricant analysis related to lubricant performance. The overall objective of this participation in FAMECE DT II was to obtain baseline data on the use of MIL-L-2104C engine oil as a hydraulic fluid with the intention of possible modifications of a future MIL-L-2104 specification to include hydraulic performance requirements not currently included.

#### FAMECE DT II EVALUATION

The original intent of this evaluation was to subject 13 vehicles to 1000 hours of field evaluation under service typical of their intended use. Operation of this prototype construction equipment and field maintenance tasks were performed by military personnel stationed at Fort Belvoir with the overall test being monitored by the Mechanical and Construction Equipment Laboratory. Equipment evaluated included

2 graders, 2 water distributors, 3 dumpers, 1 dozer, 1 loader, 1 scraper, 1 tamping-foot compactor, and 1 smooth-wheel compactor. Testing was conducted after vehicle arrival from the contractor, Clark Equipment Company. The first unit, Dumper I, arrived in July 1977; other vehicles arrived at later dates. In March 1978, before the arrival of the last two vehicles of the test set, a decision was made to terminate testing at Fort Belvoir and complete the DT II evaluation requirements at other installations. This revision of the test plan affected the data base of this report in that only five units had accumulated a significant number of operational hours during this limited time frame.

# LUBRICATION REQUIREMENTS

The lubrication orders for FAMECE require the use of a Grade 30 MIL-L-2104C engine oil (OE/HDO-30) for crankcase lubrication and a Grade 10 MIL-L-2104C engine oil (OE/HDO-10) for transmission and hydraulic system lubrication. The effectiveness of OE/HDO-30 as an engine oil and OE/HDO-10 as a transmission fluid is fairly well established. Of particular interest to MERADCOM is the use of OE/HDO-10 as a hydraulic fluid, in that this represents a significant departure from the standard lubrication requirements for combat support equipment. Normally, hydraulic fluids, such as MIL-H-6083 (OHT) and MIL-H-46170 (FRH), which were specifically designed to satisfy military hydraulic requirements are required for use in combat support equipment. No significant studies on the use of an engine oil as a hydraulic fluid in Army equipment has been reported.

Hydraulic fluids differ from engine oils in several important physical and chemical aspects. Certain parameters involved in the use of an engine oil in hydraulic applications need to be considered. Use of military

hydraulic fluids provides low temperature operability, minimal wear of critical hydraulic fluid components and a high level of rust protection for valves and exposed ram shafts. The MIL-L-2104C (OE/HDO) specification does not address the above hydraulic fluid requirements but is primarily concerned with the performance of a candidate oil in an operating diesel engine. Approximately 200 oil companies are qualified to produce MIL-L-2104C lubricants and wide variations in the type of additive package used in the oil formulation are found. This variation does not significantly affect engine performance, however, wide variations in secondary nonengine lubrication properties, that are directly related to the use of this oil in hydraulic applications, are known. For example, in the area of rust protection, a study of randomly selected samples of OE/HDO indicated variations in rust protection levels from 36 hours to in excess of 360 hours. It is suspected that certain variations in hydraulic system performance will be dependent on the types of OE/HDO-10 formulations in the supply system. On the other hand, the use of OE/HDO as a universal lubricant for military construction equipment is of particular value to this equipment since operation with minimal support is needed.

#### OBJECTIVES OF LUBRICANT EVALUATION

This Laboratory has custodial responsibility for the MIL-L-2104C specification and lubricant RDT&E programs within the Department of the Army. Presently, the use of OE/HDO-10 in satisfying hydraulic application requirements is under study. Consideration is presently being given to the optimization of hydraulic fluid performance requirements of OE/HDO-10 in a future modification of the MIL-L-2104 specification, however, such

requirements must first be defined. This participation in FAMECE DT 11 was to provide information that would serve in part as baseline data in determining the requirements needed in the future MIL-L-2104 specification.

# II. DETAILS OF TEST

# EQUIPMENT

FAMECE represents a class of wheeled construction and earthmoving equipment. Units are modular in design with a work unit consisting of a power module section coupled to a work section. Each section weighs less than 15,000 pounds. The various types of work sections used in this test are shown in Table B-1. In testing, a separate power module was used for each work section. Since all power modules are identical in construction, these units are listed by serial number. Total hours accumulated for each work unit at arrival and at test completion is also included in this table. The power train for these units consists of a Cummins VT-555 Turbo Charged 218 HP diesel engine with a Clark Model LT-7853 transmission. The hydraulic controls and a 70-gallon hydraulic reservoir are also located on the power module. The work section consists of the working component (e.g., blade, roller, etc.) and a secondary hydraulic system. LUBRICATION REQUIREMENTS

# Department Regularization

Lubrication orders require the use of MIL-L-2104C oils for engine, transmission, and hydraulic applications. SAE 30 Viscosity Grade oil is required for crankcase lubrication when expected temperatures are above  $+40^{\circ}$  F and 10 grade oil when temperatures are less than  $+40^{\circ}$  F. SAE 10 Viscosity Grade oil is required for use in transmission and hydraulic systems provided that temperatures are above  $-10^{\circ}$  F. For arctic conditions

or when the ambient temperature is less than 0°F, MIL-L-46167 (OEA) is required for use as a power train lubricant and as a hydraulic fluid. Lubrication orders originally required drain and refill of the crankcase and transmission oils at 400-hour intervals and the hydraulic fluid at 1000 hours, however, these orders were later modified to 250 hours for the crankcase oil, 500 hours for the transmission oil, and 1000 hours for the transmission fluid.

### REFERENCE OIL PROGRAM

On 14 February 1977, personnel from the Energy and Water Resources
Laboratory participated in a meeting with the FAMECE/UET staff relative
to the use of reference grade lubricants, reference grade fuels, and silicone
brake fluid in certain vehicles that were scheduled for DT II evaluation.
At this meeting, it was indicated that a reference grade fuel could not be
utilized in DT II due to logistic considerations but that possible
program coordination could be achieved relative to the use of the reference
grade lubricant and silicone brake fluid. A proposed lubricant test
plan was outlined that involved the use of a reference grade MIL-L-2104C
oil for use in crankcase, transmission, and hydraulic systems and silicone
brake fluid in the brake systems of five vehicles. Concurrence with the
test program was obtained from PMO, FAMECE/UET except that 6 rather
than 5 vehicles (1 each dumper, scraper, grader, distributor, dozer,
and compactor) would utilize reference grade oils and silicone brake fluid.

The finalized reference oil program for FAMECE DT II is included as part of Appendix B-A. This program required the forwarding of six 55-gallon drums of Grade 10 and six 55-gallon drums of Grade 30 MIL-L-2104C reference engine oils together with one gallon of a candidate MIL-B-46176 silicone

brake fluid to the FAMECE facility at Clark Equipment Company, Benton Harbor, Michigan, and the factory use of this fluid for factory fill of six vehicles. The vehicles were later identified as those vehicles having power sections with serial numbers 446X107 to 446X112. Following this, the major part of the reference oil program was to involve the monitoring of this set of vehicles during testing by periodic oil sampling/analysis to determine overall MIL-L-2104C/FAMECE system compatibility as reflected by wear metal analysis and potential degradation of lubricants as indicated by selected tests designed to measure lubricant quality. Other vehicles not included in the test plan were to have used a commercial oil of MIL-L-2104C quality for factory fill and OE/HDO from the supply system for refill requirements.

Several factors had considerable impact on the data base provided by this cooperative program. These factors include:

- Early Termination of DT II. Only five vehicles had accumulated sufficient operational hours to be of value in satisfying the test objectives.
- 2. <u>Invalid Commercial Oil</u>. Analysis of the physical properties and elemental composition of the factory fill oil indicates that it is not a MIL-L-2104C oil and cannot serve as a basis for comparison with the reference oil.
- 3. <u>Factory Errors in Fill of Reference Vehicles</u>. The factory fill commercial oil was used in place of the reference oil in the hydraulic system of the dumper and dozer.
- 4. Test Plan Modification on Silicone Brake Fluid. Silicone brake fluid use was limited to the dumper and dozer.

The combination of these factors prevented any conclusions concerning the effectiveness of OE/HDO-10 lubricants in the FAMECE hydraulic system.

Due to changes in the original lubrication order, the sampling schedule outlined in the reference oil program was modified. Samples of engine, transmission, and hydraulic fluids were obtained on vehicle arrival at the test site and at vehicle accumulated hour readings of 250, 500, 750, and 1000 hours. Two types of oil samples were obtained.

Drain samples (32-ounce) were collected at scheduled drain and refills, and 12-ounce intermediate samples were collected by the standard vehicle sample procedure using a syringe and plastic tubing. Several laboratories, including the Materials Technology Laboratory and the Energy and Water Resources Laboratory, MERADCOM, and the Army Fuels and Lubricants Research Laboratory (located at Southwest Research Institute), were involved in the analyses of these oil samples.

### FUEL MONITORING ACTIVITY

In addition to the reference oil program, MERADCOM became actively involved in fuel-related programs that developed in FAMECE DT II. The primary activity in this area was a fuel cloudpoint monitoring program during the winter months. The activity was initiated by reported cold startup problems possibly related to fuel quality. Other problems, such as fuel filter clogging, were also investigated.

### III. RESULTS OF TEST

Lubricant performance was evaluated primarily by physical and chemical testing of used oil samples from FAMECE equipment and by physical inspection of engine and transmission components from one of these vehicles.

This latter inspection, conducted on a vehicle during teardown, showed

certain typical wear patterns which significantly facilitated the interpretation of data on wear metal concentrations.

# ENGINE/TRANSMISSION INSPECTION

A DT II test program requirement included physical teardown and replacement of the engine and transmission components on one of the vehicles. Teardown was performed on the 10-ton dumper unit (power module 446X108 and dumper I work section) that had accumulated 1250 hours of long- and short-haul service under fully loaded conditions. Inspection data on the component parts of the Cummins Model VT555-C240 engine and Clark Model LT-7953 transmission are included in Appendix B-B. Inspection of the pistons, rings, crankshaft, camshaft, and valve train indicated normal wear patterns. The primary problem area was severe wearing of the No. 4 (rear) bearing. It was observed that a large quantity of copper was dislodged from the bearing surface. A peripheral problem involved scoring of thrust washers by dislodged copper debris. Transmission parts did not show any abnormal wear patterns. Mr. A. Barnabae, Field Technician for Cummins Diesel Engines, Inc., was present at teardown. He indicated that No. 4 (rear) bearing failures are normally indicative of lubricant starvation due to cold startups or insufficient engine idling before shutdown.

# NEW OIL ANALYSIS

The physical properties and elemental compositions that characterize the commercial and reference oils used in this test are listed in Tables B-2 and B-3. Significant differences in chemical properties such as total acid number (TAN), total base number (TBN), and elemental composition are evident. It should be noted that the SAE 10 Viscosity

Grade commercial oil (Table B-3) has a pour point of -11° F. This indicates that the commercial oil is not of MIL-L-2104C quality since this specification requires a pour point of -25° F. The relatively high pour point of this commercial product could result in low-temperature lubricity problems.

### WEAR METAL ANALYSIS

The concentrations of wear metals, silicone, and additive metals that were found in used oil samples from the grader, loader, water distributor, dozer, and dumper are presented in Tables B-4 through B-8. From this set of vehicles, the dozer and dumper were to be factory filled with the reference lubricant and the other vehicles were to be factory filled with a commercial lubricant.

Additive metal concentrations were included in these tables so as to allow calculations of dilutional effects and to verify the type of oil used for factory fill and field refill. Examination of Table B-3 reveals that the primary difference between the SAE 30 Viscosity Grade commercial and reference oil is that the reference oil contains approximately 4400 parts per million (p/m) of calcium, whereas the commercial oil contains 2500 p/m calcium. Inspection of the calcium concentration in initial engine oil samples taken from these vehicles (Tables B-4 - B-8) indicates that the factory-fill procedure was correct. Examination of Table B-2 indicates that the SAE 10 Viscosity Grade commercial oil contains barium, whereas SAE 10 Grade reference oil does not. Inspection of Tables B-4 through B-8 indicates the commercial product was mistakenly used for factory fill of the dozer transmission. This error is not considered serious since the reference oil was used as a refill oil at the 500-hour drain interval. Examination of these tables also indicates

that the commercial oil was used as the hydraulic fluid in all of these vehicles. The vehicles hydraulic systems were not factory filled with reference oil. This factory error invalidated the primary objective of this study.

Silicone is normally considered as a contaminant metal. The concentration of elemental silicone in the used oil samples is a measure of dirt (silica) ingestion and is included in these tables since extremely dusty conditions were noted at the test site during summer months and in view of the ever present possibility of accidental dirt ingestion during oil addition. Dirt ingestion would be expected to result in an accelerated wear of all engine components. Oil analysis data indicate a fairly constant and low level of silica in the engine oil. The effect of this component on engine wear appears to be minimal in that the aluminum concentration (from piston skirts), iron concentration (from cylinder walls, crankshaft, and camshaft), and chromium (from piston rings) did not show any direct variation with silicone concentration.

The inspection of engine parts during teardown indicated a potential bearing wear problem. Bearings utilized in the FAMECE are of a steel backing, copper flashing, and lead overlay design. Normal bearing wear would be indicated by the initial presence of lead followed by copper after a wearing away of the lead overlay. In these tables, wear metal data are presented for engine oil samples collected on vehicle arrival at the test site and at each 250-hour drain interval. The reference oil was used as the refill oil for all of these vehicles. With the exception of the water distributor, all units showed elevated copper and lead concentrations. These results suggest an accelerated bearing wear. The

absence of bearing wear signs in the water distributor is difficult to explain since a variety of factors, such as the inability to use the distributor during winter months, the operator, speed, and load, need to be considered. Findings suggest that there is no clear indication of differences in the commercial and reference oils inability to prevent rapid bearing wear. Another factor that needs to be considered is that bearing failure is characterized by the coarse copper metal particles which would not be detected in oil analysis. For example, in the dumper where bearing failure has been documented, high lead concentrations considerably in excess of the copper concentrations are found. This is not true in the case of the grader, loader, distributor, and dozer. Wear metal data for the grader, loader, and dozer indicate copper concentrations in excess of lead concentrations which may indicate a more normal but accelerated bearing wear. Although the copper/lead concentrations show a general decrease, these units show significant increases in iron concentrations that tend to indicate some type of wear problem.

Inspection of wear metal concentrations in the transmission oil samples indicates high copper, lead, and iron levels. These levels reflect the initial break-in process. After the initial 500-hour oil change, the wear metal concentrations significantly decrease in all vehicles with the exception of the dumper. Although copper and lead levels were high in the dumper, physical inspection of this transmission did not indicate any unusual wear problems.

Used oil samples from the hydraulic systems of the vehicles indicate slightly elevated copper levels in the grader, dozer, and dumper and slightly elevated iron levels in the loader and dozer. These levels

was a ser

might be due to abrasive wear due to dirt ingestion. The iron concentration of these oils would be indicative of wear of the hydraulic control valves; however, since a physical inspection of the dumper hydraulic system could not be made, no correlation of wear metal concentrations with hydraulic system wear can be made.

### LUBRICANT DEGRADATION

Viscosity changes and the amount of pentane insolubles in used engine oils are presented in Table B-9, and data on the viscosity changes and total solid contents of transmission and hydraulic fluids are presented in Table B-10. Due to a shortage of laboratory personnel, pentane insolubles and solid contents were determined on only a few randomly selected oil samples. Data from Table B-9 indicate an average engine oil viscosity increase of approximately 9% for 250 hours of operation. Viscosity increases as high as 25% are considered acceptable. Data do not indicate excessive deterioration of OE/HDO-30. Data from Table B-10 indicate minimal solid contents and viscosity increases in used transmission oils and hydraulic fluids. The apparent viscosity increase in the commercial oil is questionable. The reference oil viscosity of 6.7 cSt is considerably in excess of the 6.0 cSt viscosity of the commercial oil, and the use of the reference grade oil as make-up would at least contribute to this observed viscosity increase. No significant viscosity increases were found in the used reference oil samples.

### SILICONE BRAKE FLUID

Of the two units utilizing silicone brake fluid, one is still under test. Admixing of VV-B-680 brake fluid (glycol-based) with the

silicone fluid invalidated testing on one of the two vehicles. No problems directly related to the use of this brake fluid were reported. FUEL SURVEILLANCE

Certain starting/engine failure problems during DT II testing were suspected of being related to VV-F-800B diesel fuel quality. As part of this cooperative effort, technical assistance was provided in the resolution of fuel-related problems as they occurred. Primary problems were traced to housekeeping practices, fuel contamination of unknown origin, and use of a nonrecommended fuel deicing agent. A complete chronological account of the problems with supportive laboratory data is presented in Appendix B-C.

### IV. CONCLUSIONS

Based on the results of this test and observations made during the test, it is concluded that:

- Wear metal analysis indicates an accelerated wear of main bearings in the FAMECE power modules.
- Contributing factors to bearing wear are believed to be due to nonconformity to lubrication order requirements to use the SAE 10 Grade MIL-L-2104C engine oil for ambient temperatures less than +40° F and amproper operational procedures.
- The performance of the SAE 10 MIL-L-2104C engine oil in the FAMECE hydraulic system has not been identified in FAMECE DT II. A commercial factory fill oil that does not correspond to the SAE 10 Grade MIL-L-2104C specification was used as the factory fill product for the five vehicles that served as the basis of this report.

 Cold starting problems reported in FAMECE DT II were the result of the use of diesel fuel of marginal quality.

### V. RECOMMENDATIONS

Based on the observations and conclusions drawn from this test, it is believed that the following recommendations should be considered:

- Instruct vehicle operators in proper cold starting and engine shutoff procedures and/or modify engine bearings in order to reduce bearing wear. The effectiveness of these procedures can be monitored by the continuation of the engine oil analysis program.
- Evaluate the effectiveness of SAE 10 Grade MIL-L-2104C oil in the FAMECE hydraulic system. An inspection of hydraulic component parts for wear should be part of this evaluation.
- Investigate the possibility of modifying the fuel filter/water separator system to be more fuel tolerant.

Table B-1. FAMECE Test Equipment

Power Module (Serial No.		Hours at Start of Test	Power Section Hours at End of Test	Lubricant Type
446 X 104	Grader I	273	1061	Comm oil <sup>2</sup>
105	Loader	153	1103	Comm oil
106	Distributor I	97	901	Comm oil
107	Dozer	78	824	${\rm Ref\ oil}^3$
108	Dumper I	20	1266	Ref oil
110	Tamping Foot	110	406	Ref oil
112	Smooth Wheel	63	355	Ref oil
113	Dumper II	26	400	Comm oil
114	Scraper	29	251	Comm oil
115	Distributor II	10	247	Comm oil
116	Grader II		540	Comm oil

<sup>1</sup> These units used a silicone brake fluid.

 $<sup>^{2}</sup>$  Commercial oil used for hydraulic fluid, crankcase, and transmission lubrication.

 $<sup>^{3}</sup>$  Reference oil used for hydraulic fluid, crankcase, and transmission lubrication.

Table B-2. FAMECE Factory-Fill 10 Grade Lubricants

011 Type	Commercial Oil	Reference 0il
Properties:		
Viscosities, cSt		
@ 100° F	38.72	47.0
@ 210° F	5.97	6.7
Index	107.72	10.3
TAN	1.74	2.5
TBN	9.26	12.7
Insolubles, %		
Pentane	0.012	0.02
Pentane w/Coag.	0.004	0.01
Benzene	0.00	0.02
Benzene w/Coag.	0.017	0.01
Gravity, API @ 60° F (15.5° C)	29.5	28.3
Flash Point, OF	435° F (224° C)	417° F (214° ( -24° F (-31° (
Gravity, API @ 60° F (15.5° C) Flash Point, F	435° F (224° C) -11° F (-24° C)	-24° F (-31° (
Carbon Residue, %	1.45	1.7
Sulfated Ash, %	1.47	1.7
lements:		
Nitrogen, % wt	0.330	0.06
Boron, p/m	13	
X-Ray Flor, %		
Barium	0.2060	
Calcium	0.3080	
Chlorine	0.0120	<0.01
Copper, p/m	<b>&lt;</b> 25	
Phosphorus	0.1000	0.12
Sulfur	0.2900	0.42
Zinc	0.0800	
Atomic Absorption, p/m		
Barium	1910	<b>&lt;</b> 50
	2932	4400
Calcium		
Copper	<b>&lt;</b> 1	
Copper Magnesium	88.0	22
Copper		

NOTE: "Less than" symbol (<) used to indicate lowest detection level of method.

Table B-3. FAMECE Factory-Fill 30 Grade Lubricants

Dil Type	Commercial Oil	Reference 0il
Properties:		
Viscosities, cSt		
@ 100° F	119.4	121.0
@ 210° F	12.15	12.0
Index	99.54	101
TAN	1.70	2.3
TBN	6.75	13.9
Insolubles, %		
Pentane	0.018	0.04
Pentane w/Coag.	0.004	0.04
Benzene	0.00	0.03
Benzene w/Coas.	0.008	0.01
0 0 0	27.3	25.5
Flash Point F	450° F (232° C)	433° F (233° C
Gravity, API @ 60° F (15.5° C) Flash Point, F Pour Point, F	27.3 450° F (232° C) -7° F (-22° C)	25.5 433° F (233° C +2° F (-17° C
Carbon Residue, %	1.13	2.1
Sulfated Ash, %	0.94	1.6
Elements:		
ciements.		
Nitrogen, % wt	0.0660	0.07
Nitrogen, % wt Boron, p/m	0.0660 <1	0.07
		0.07
Boron, p/m		0.07
Boron, p/m X-Ray Flor, %	<1	
Boron, p/m X-Ray Flor, % Barium	<1 <0.0220	0.07   <001
Boron, p/m X-Ray Flor, % Barium Calcium	<0.0220 0.2350	
Boron, p/m X-Ray Flor, % Barium Calcium Chlorine	<0.0220 0.2350 0.0130	  <001
Boron, p/m X-Ray Flor, % Barium Calcium Chlorine Copper, p/m	<0.0220 0.2350 0.0130 <25	<001
Boron, p/m X-Ray Flor, % Barium Calcium Chlorine Copper, p/m Phosphorus	<0.0220 0.2350 0.0130 <25 0.1200	<001  0.13
Boron, p/m X-Ray Flor, % Barium Calcium Chlorine Copper, p/m Phosphorus Sulfur Zinc	<0.0220 0.2350 0.0130 <25 0.1200 0.4400	<001 0.13 0.48
Boron, p/m X-Ray Flor, % Barium Calcium Chlorine Copper, p/m Phosphorus Sulfur	<0.0220 0.2350 0.0130 <25 0.1200 0.4400	<001 0.13 0.48
Boron, p/m X-Ray Flor, % Barium Calcium Chlorine Copper, p/m Phosphorus Sulfur Zinc Atomic Absorption, p/m	<1 <0.0220 0.2350 0.0130 <25 0.1200 0.4400 0.0900	<001  0.13 0.48
Boron, p/m X-Ray Flor, % Barium Calcium Chlorine Copper, p/m Phosphorus Sulfur Zinc Atomic Absorption, p/m Barium Calcium	<1 <0.0220 0.2350 0.0130 <25 0.1200 0.4400 0.0900 <50	<001 0.13 0.48
Boron, p/m X-Ray Flor, % Barium Calcium Chlorine Copper, p/m Phosphorus Sulfur Zinc Atomic Absorption, p/m Barium Calcium Copper	<1 <0.0220 0.2350 0.0130 <25 0.1200 0.4400 0.0900 <50 2531	<001  0.13 0.48  <50 4400
Boron, p/m X-Ray Flor, % Barium Calcium Chlorine Copper, p/m Phosphorus Sulfur Zinc Atomic Absorption, p/m Barium Calcium	<1 <0.0220 0.2350 0.0130 <25 0.1200 0.4400 0.0900 <50 2531 <1	<001 0.13 0.48 <50 4400

NOTE: "Less than" symbol (<) used to indicate lowest detection level of method.

Table B-4. Summary of Oil Analysis Data

Vehicle Type: Grader

Power Section: 446X104

		W	ear Met	als			Addi	tive Me	tals	
Mileage	Aluminum	Iron	Chromium	Copper	Lead	Silicone*	Phosphorous	Barium	Zinc	Calcium
				E	Engine Oi	.1				
273	20	5	3	23	10	3	720		820	1350
500	8	20	2	30	3	6	750	90	860	1800
750	20	40	0	18	6	10	720	10	1100	4500
1000										
				Tran	smission	011				
273	37	86	2	280	70	6	650		500	3600
500	22	47	0	300	40	6	700	1000	860	4500
750	35	45	3	92	16	10	780	300	530	
1000	25	37	2	88	7	7	640	270	600	
				Hyd	raulic F	luid				
273	40	8	2	6	1	8	680		860	3200
500	18	4	0	5	0	3	750	1100	1100	5000
750	33	9	1	22	1	13	600	860	540	
1000	32	10	1	19	1	11	590	810	590	

Table B-5. Summary of Oil Analysis Data

Vehicle Type: Loader
Power Section: 446X105

_		W	ear Met	als			Addi	tive Me	tals	
Mileage	Aluminum	Iron	Chromium	Copper	Lead	Silicone*	Phosphorous	Barium	Zinc	Calcium
				Et	gine Oi	1				
154 250	26	10	2	5	9	7	680		800	1800
500 750	18	26	0	200	17	3	650	50	700	7000
1000	54	73	28	6	1	12	530	0	030	
				Trans	mission	Oil				
154	40	55	3	500	75	8	580		800	3000
250	38	80	2	400	50	8	550		500	3200
500 750	21	57	0	350	25	5	750	1080	1100	6500
1000	28	68	2	160	64	10	640	500	650	
				Hydr	raulic F	luid				
154	38	7	1	5	1	8	660		860	3700
250	34	16	3	8	8	6	700		650	3500
500 750	18	11	0	8	0	4	755	1300	1000	6000
1000	26	18	3	7	1	11	650	1050	690	

Table B-6. Summary of Oil Analysis Data

Vehicle Type: Water Distributor I

Power Section: 446X106

Wear Metals   Additive Metals	catcium
Engine Oil  96	carcium
96 25 8 4 8 10 12 750 680 16 250 500 21 27 0 5 6 0 640 10 860 550 750 26 28 5 5 1 6 530 0 570 1000  Transmission 0i1  96 36 50 2 215 55 8 550 500 310	
250 500 21 27 0 5 6 0 640 10 860 550 750 26 28 5 5 1 6 530 0 570 1000  Transmission 0i1  96 36 50 2 215 55 8 550 500 310	
750 26 28 5 5 1 6 530 0 570  1000  Transmission 0i1  96 36 50 2 215 55 8 550 500 310	50
1000  Transmission 0i1  96 36 50 2 215 55 8 550 500 310	00
<u>Transmission 0i1</u> 96 36 50 2 215 55 8 550 500 31	
96 36 50 2 215 55 8 550 500 310	
96 36 50 2 215 55 8 550 500 310	
250 21 35 0 135 17 0 700 600 1000 750	00
	00
500 22 50 0 240 130 0 500 330 1100 650	00
750 29 35 3 88 4 10 990 0	
1000	
Hydraulic Fluid	
96 36 9 2 17 6 12 700 600 430	00
250 21 2 0 12 0 0 750 1200 1100 600	00
500 17 5 0 12 12 6 700 1100 1000 500	00
750 29 8 1 14 4 11 640 1200 570	
1000	

Table B-7. Summary of Oil Analysis Data

Vehicle Type: Dozer

Power Section: 446X107

	Wear Metals						Addit	ive Met	als	
Mileage	Aluminam	Iron	Chromium	Copper	Lead	Silicone*	Phosphorous	Barium	Zinc	Calcium
				Er	ngine Oi	1				
78	32	14	1	65	10	20	550		450	4000
250	30	7	6	94	25	16	750	40	1200	6000
500	23	38	0	52	13	3	660	0	1100	7500
750										
1000										
				Trans	smission	Oil				
78	47	74	4	1100	200	12	750		480	3700
250	31	76	0	550	250	5	800	380	780	5000
500	33	60	9	700	130	3	820	220	1100	5000
833	32	29	0	130	34	11	580	0	500	
				****		, ,,				
					raulic F					
78	36	7	2	7	8	8	700		600	5200
250	17	1	0	6	2	3	750	920	1000	6000
500										
833	32	13	1	12	1	9	750	820	720	
1000										

Table B-8. Summary of Oil Analysis Data

Vehicle Type: Dumper
Power Section: 446X108

	W	ear Met	als			Addit	ive Me	tals	
Aluminum	Iron	Chromium	Copper	Lead	Silicone*	Phosphorous	Barium	Zinc	Calcium
			E	ngine Oi	1				
44	5	2	8	10	10	680		740	4100
45	42	3	18	55	16	580		720	4400
20	20	3	10	6	0	600	0	1100	7500
34	38	17	27	90	20	650	0	950	6000
33	60	11	17	68	9	530	0	580	
			Trans	smission	Oil				
48	10	2	95	45	8	760		880	1200
45	. 25	2	200	60	7	680		860	5700
20	9	0	86	18	5	740	0	1000	6000
31	49	2	450	178	6	780	0	630	
			Hydi	raulic F	luid				
43	5	3	3	1	7	760		900	5300
45	0	1	5	1	8	760		900	5300
22	0	0	6	0	4	800	540	1100	6000
22	1	0	7	0	5	770	560	800	6000
31	7	2	12	1	9	780	560	650	
	44 45 20 34 33 48 45 20 31	### ### ### ### ### ### ### ### ### ##	### ### #### #### ####################	E  44	Engine Oi  44	Engine Oil   S   S   S   S   S   S   S   S   S	Engine Oil  44	Figure   F	Figure   Color   Figure   Fi

Table B-9. Viscosity and Insoluble Content of Engine Oils

		Commercial C 30 Grade	oil	Reference Oil 30 Grade		
	Grader (446X104)	Loader (446X105)	Distrib (446X106)	Dozer (446X107)	Dumper (446X108)	
	Vis (cSt @ 210° F) 1 Insol	Vis (cSt @ 210°F) Insol	Vis (cSt @ 210°F) Insol	Vis (cSt @ 210°F) Insol	Vis (cSt @ 210°F) Insol	
Viscosity of New Oil		12.1		12.2		
Initial Oil <sup>2</sup> Sample	11.5	10.9 0.034	11.8	12.5 0.50	12.7 0.02	
lst Oil Drain	11.6			13.0 0.19	13.0 0.26	
2nd Oil Orain	13.3	12.7	13.4	13.3	13.7	
3rd 0il Orain			13.4		14.2	

 $<sup>^{\</sup>mathrm{1}}$  Pentane insolubles determined by ASTM method D893.

<sup>&</sup>lt;sup>2</sup> Initial samples taken on delivery of vehicles to Ft. Belvoir. Operating hours were grader (273), loader (153), distributor (97), dozer (78), and dumper (20).

### APPENDIX B-A

### REFERENCE OIL PROGRAM

FOR

### FAMECE DT II

### **PURPOSE**

To identify possible wear problems, oil/system compatibility, and oil degradation in FAMECE equipment.

### SCOPE

A set of six vehicles (one each dumper, scraper, grader, distributor, dozer, and compactor) from the FAMECE DT II test group will utilize reference grade MIL-L-2104C fluids in engines, transmissions, and hydraulic systems, and a silicone-based brake fluid in the power and work sections. This set of vehicles will be monitored during testing by periodic oil sampling/analysis to determine overall MIL-L-2104C/FAMECE system compatibility as reflected by wear metal analysis, or quality, and potential degradation of lubricants. Silicone brake fluid will be evaluated on a performance basis.

### TEST FLUIDS/LUBRICANTS

The following test fluids/lubricants will be furnished by the Fuels and Lubricants Division, Energy and Water Resources Laboratory, MERADCOM:

### 1. For Factory Fill:

- a. Twelve 55-gallon drums of Grade 10, MIL-L-2104C, Reference Engine Oil (OE/HDO-10).
- b. Two 55-gallon drums of Grade 30, MIL-L-2104C, Reference Engine 0il (0E/HD0-30).
  - c. Two 1-gallon cans of silicone-based brake fluid.

### 2. For Operations:

- a. Six 55-gallon drums of Grade 10, MIL-L-2104C, Reference Engine 0il (0E/HD0-10).
- b. Six 55-gallon drums of Grade 30, MIL-L-2104C, Reference Engine 0il (0E/HD0-30).
  - c. One 1-gallon can of silicone-based brake fluid.

The factory-fill engine lubricant will be forwarded directly from the manufacturer to Clark Equipment Company, FAMECE Facility (ATTN: CPT S. Miszkelvitz); Meadowbrook and Dewey Streets; Benton Harbor, MI 49022.

It is estimated the lubricants will arrive at Clark Equipment by 30 Apr 77. The remaining materials will be supplied from MERADCOM to the equipment manufacturer or test site, as applicable.

### TEST PROCEDURE

The lubricant testing portion of DT II will be according to the following procedure:

### 1. Factory Fill and Equipment Identification:

- a. Reference Grade MIL-L-2104C, OE/HDO-10 and OE/HDO-30: The transmissions, scraper, hydraulic systems, and crankcases of the six referenced vehicles should be filled initially with the reference grade OE/HDO-10 and OE/HDO-30 fluids in accordance with the equipment lubrication orders. After fill, these vehicles should be identified by spraying the filling ports with a suitably colored heat-resistant paint (e.g., bright red).
- b. <u>Silicone-Based Brake Fluid</u>: Silicone brake fluid should be used in place of the HBA VVB 680 brake fluid in these six vehicles. General hygiene should be practiced when handling this fluid. Employees should be instructed that silicone is a contact eye irritant and that hands should be washed well before rubbing eyes. Spills on metal surfaces that are to be spray painted can be cleaned with any organic type solvent.
- 2. Field Testing: During vehicle testing, compatibility will be monitored through used oil analysis. Oil sampling will be conducted on a 200-hour interval basis either by extraction of a small sample (8 oz) of fluid from the filling ports by use of syringe and length of tubing or by collection of a large sample (32 oz) during engine and transmission oil drain. Oil sampling will be performed by personnel from the Fuels and Lubricants Division, Energy and Water Resources Laboratory, MERADCOM; however, drain sample collection by maintenance personnel may be required if drain intervals are irregular. If such assistance is required, labeled 32-oz sample bottles will be supplied by this Laboratory.
- a. Hydraulic fluid samples will be taken on a 200-hour interval basis and analyzed for water content, particulate contamination, viscosity changes, and other tests as appropriate.
- b. Transmission and crankcase oils will be analyzed in accordance with the table. Additive depletion in transmission fluid will be monitored by infrared techniques and other tests as appropriate.
  - c. Sample analysis will be performed by MERADCOM.
- d. Reports of findings will be forwarded to the Product Manager's Office for FAMECE/UET.

New and Used Oil Sampling and Analysis Schedule

Type Sample	New	1	dours of	Engine (	Operation	n
and Analysis*	011	200	400	600	800	1000
Type Sample**	1	2	2	2	2	2
Viscosity						
@ 210° F	X	X	X	X	X	X
@ 100° F	X	X	X	X	X	X
Total Acid No.	X	X	X	X	X	X
Total Base No.	X	X	X	X	X	X
Insolubles						
Pentane (A & B)	X	X	X	X	X	X
Benzene (A & B)	X	X	X	X	X	X
Gravity	X		X		X	
Flash Point	X		X		X	
Pour Point	X		X		X	
Carbon Residue	X		X		X	
Sulfated Ash	X		X		X	
Wear Metals***	X	X	X	X	X	X

<sup>\*</sup> Analyses to be conducted using the following methods:

Analysis	Method
Viscosity (210° F and 100° F)	D445
Total Acid Number	D664
Total Base Number	D2876
Insolubles (Pentane and Benzene)	D893 (Procedures A and B)
Flash Point	D92
Pour Point	D97
Carbon Residue	D524
Sulfated Ash	D872
Wear Metals	Atomic Absorption

<sup>\*\* 1 = 32-</sup>oz sample; 2 = 8-oz sample \*\*\* Wear metals (Mo, Pb, Fe, Al, and Cu)

- 3. Information to be Recorded: The following information should be maintained during the course of the test in the form of a test diary:
  - a. Oil Consumption: Date, hours, miles, and quantity added.
- b. Engine Maintenance: Date, action, and reason (i.e., scheduled or unscheduled).
  - c. Changes in engine power/performance.

### FUEL QUALITY

If desired, fuel quality evaluations can be made by this Laboratory.

### APPENDIX B-B

INSPECTION OF ENGINE AND TRANSMISSION FROM FAMECE DUMPER I

### DEPARTMENT OF THE ARMY US ARMY MOBILITY EQUIPMENT RESEARCH & DEVELOPMENT COMMAND FORT BELVOIR, VIRGINIA 22060

jtw/43576

DRDME-GL

22 February 1978

MEMORANDUM FOR RECORD

SUBJECT: Inspection of Engine and Transmission From FAMECE/UET Unit No. 3

On 15 and 16 February 1978, Messrs. Bowen and Kennedy performed the subject inspection. The following provides data covering the items inspected and summarizes the inspection findings:

### ENGINE

### TRANSMISSION

 Make:
 Cummins
 Make:
 Clark

 Model:
 VT555-C240
 Model:
 LT-7853

 Serial No:
 20160902
 Serial No:
 63013T

### OPERATION

Unit:

FAMECE Dumper

Service: Long and short haul, fully loaded

Time: 1250 Hrs

### INSPECTION (Engine)

Compor	ent		Description
Pistons General		1	Pistons were in satisfactory condition. Deposits were low. All rings were free and in good condition. All skirts showed moderate scratching resulting from dirt ingestion. Also the thrust side of #7 and #8 pistons showed several small areas of light scuffing which could have resulted from the dirt ingestion or from cold starting.
	No. 1	Rings	Free and in good condition (wear ½ way across 2nd compression)
		Land 2	100% coverage with LC to MC deposits
		Land 3	100% coverage with lacquer deposits (BL-AL)
		Skirt	Lt - Medium scratching

DRDME-GL SUBJECT: Inspection of Engine and Transmission From FAMECE/UET Unit No. 3

### INSPECTION (Engine) (Cont'd)

Component			Description			
Pistons	Gene	ral	Cont'd			
	No. 2	Rings	Same as #1			
		Land 2	Same as #1			
		Land 3	100% coverage with AL-LAL deposits			
		Skirt	Lt - Med scratching			
	No. 3	Rings	Same as #1			
		Land 2	Same as #1			
		Land 3	40% coverage with LC-MC, 60% coverage with			
			BL-AL deposits			
		Skirt	Same at #1			
	No. 4	Rings	Same as #1			
		Land 2	Same as #1			
		Land 3	20% coverage with LC, 50% with AL-LAL and 30% clean			
		Skirt	Same as #1			
	No. 5	Rings	Same as #1			
		Land 2	Same as #1			
		Land 3	50% coverage with AL-LAL, 50% clean			
		Skirt	Same as #1			
	No. 6	Rings	Same as #1			
		Land 2	80% coverage with LC-MC, 10% BL-DBRL and			
			10% clean			
		Land 3	15% coverage with LC, 55%			
		Skirt	Same as #1			
C-00-040	No. 7	Rings	Same as #1			
		Land 2	90% coverage with LC-MC, 10% BL-DBRL			
		Land 3	30% coverage with AL-LAL, 70% clean			
		Skirt	Heavy scratch, several small areas of light scuffing			
	No. 8	Rings	Same as #1			
		Land 2	Same as #1			
		Land 3	85% coverage with LC-MC, 15% with BL-AL			
		Skirt	Heavy scratching, one small area of light scuffing			

DRDME-GL 22 February 1978 SUBJECT: Inspection of Engine and Transmission From FAMECE/UET Unit No. 3

### INSPECTION (Engine) (Cont'd)

Component	Description		
Connecting Rod Bearings	All bearings showed scratching which was heaviest on Nos. 3, 5, 6, and 8 bearings. In the case of the No. 6 bearing, the scratching was into copper underlay which showed heavy pitting. Pitting of the overlay was observed on all bearings.		
Main Bearings	All bearings showed heavy scratching and wiping. The copper underlay was showing in varying degrees on all bearings and the No. 4 (rear) bearing showed a large quantity of the copper removed. Also pitting of the copper underlay was observed on the No. 3 bearing.		
Cam Shaft & Valve Train	Appeared normal with the exception of the inner bearing journals, which showed a significant amount of scratching. The drive gear appeared normal, as did other valve train components.		
Crankshaft	All main and connecting rod journals showed scratching		
Thrust Washer	Showed severe scoring with large quantitie of copper from main bearings embedded in surface.		
Combustion Chamber	Showed very low deposits (note valves were not removed).		
ther	Oil pan, valve covers, valve deck, etc. were free of sludge and lacquer deposits.		

DRDME-GL 22 February 1978
SUBJECT: Inspection of Engine and Transmission From FAMECE/UET Unit No. 3

### INSPECTION (Transmission)

The transmission appeared to be in satisfactory condition. Gears and bearings showed normal wear patterns. Although clutch packs showed some transfer of material between plates, their condition was considered acceptable.

T. BOWEN

P. KENNEDY

APPENDIX B-C

FUEL PROBLEMS ASSOCIATED WITH FAMECE DT II

### US ARMY MOBILITY EQUIPMENT RESEARCH & DEVELOPMENT COMMAND FORT BELVOIR, VIRGINIA 22060

DRDME-GL

3 February 1978

MEMORANDUM FOR RECORD

SUBJECT: Fuel Problems Associated with FAMECE Units

- 1. This office was requested on numerous occasions to evaluate reported fuel-related problems that surfaced during DT-II testing of FAMECE equipment at Ft. Belvoir, North Area. In view of the involvement of these onsite investigations, a chronological account of the problems, causitive factors, and corrective actions/potential solutions are presented.
- 2. In late August 1977, fuel filter plugging of one FAMECE power unit was noted. Subsequent analysis of the filter unit revealed the contaminent to be primarily iron oxide with trace amounts of silica and diesel fuel degradation products. This problem was subsequently traced to rusting of the interior bare metal surface of the fuel storage tank. These findings and recommendations were provided in a DF dated 28 September 1977 to DRCPM-FM-TM (Incl 1). The corrective action involved a change in the fuel storage location.
- 3. In early December 1977, difficulties were reported in the starting of the FAMECE power modules. From the initial reports forwarded to this office, it was inferred that fuel "waxing" or "freezing" was considered to be suspect. On 14 December 1977, diesel fuel was sampled from the fuel tank and filter units of one of the effected FAMECE units (SCRAPER). Since "waxing" had been mentioned, our initial concern was to determine whether the proper diesel fuel was being used. To ascertain this, the fuel's cloud point was suspect. More specifically, the critical fuel factor affecting low-temperature operability is the cloud point. This is that temperature point wherein the first appearance of "wax" occurs as a precipitate. This separated wax can create a variety of problems such as fuel filter plugging, fuel line stoppage/restrictions, etc. The presence of trace water can also contribute to this problem when operating below the freezing point of water. Federal Specification VV-F-800b, "Fuel Oil, Diesel" provides a temperature percentile guide for specifying the cloud point of diesel fuel to be procured. For December, the diesel fuel to be used/ procured in Virginia should have a cloud point not to exceed 26° F. The sample obtained from the fuel tank of the malfunctioning FAMECE had a cloud point of 46° F which is in excess of the specified limit indicating possible fuel waxing problems. This suspect fuel was traced to the fuel

SUBJECT: Fuel Problems Associated with FAMECE Units

stored in No. 1 Storage Tank, as this fuel had a cloud point of  $48^{\circ}$  F. It can be concluded that the relatively high cloud point of the diesel fuel being used was contributing to engine start-up failures as a result of the unusually cold temperatures being experienced in early December.

- 4. The No. 1 Storage Tank has a fill capacity of 10,000 gallons, and its construction is such that the fill pipe end is fixed at 3 inches above the tank bottom. At the time of sampling mentioned above, 2000 gallons of diesel fuel remained in this tank. On 14 December however, a delivery of 8000 gallons of diesel fuel was received and introduced into No. 1 Storage Tank. Subsequent analysis of the co-mingled fuel in No. 1 Storage Tank revealed the diesel fuel to have a cloud point of 64° F. This relatively high cloud point obviously was suspect relative to the limitation imposed under VV-F-800b for December (cloud point should not exceed 26° F). To ascertain whether fuel contamination, comingled product, etc., had occurred, Ft. Belvoir Quality Assurance Program which provides for procurement product monitoring became involved. This program involves sampling of diesel fuel from delivery trucks prior to or during dispensing into holding tanks. The samples are subsequently forwarded to New Cumberland Army Depot, Petroleum Field Office (East) for analysis in conformance to specification requirements. Fuel samples (Nos. 3958-78 and 3959-78) obtained from the 14 November 1977 and 14 December 1977 deliveries to No. 1 Storage Tank which had been forwarded to New Cumberland Army Depot were reported to be in accordance with the limits required under VV-F-800b, (Incl 2). Since their findings indicated that specification fuel was delivered in November and December, a possible explanation as to the wide discrepancies in Cloud Point may be related to water adsorption or other heavier product contamination remaining in the fuel system. The water contamination could have been attributed to the 1/2 to 1 inch of water bottoms in No. 1 Storage Tank. In order to minimize and/or eliminate this problem, removal of water bottoms and adequate quality surveillance as specified in MIL-STD-HDBK-200 E was and is recommended.
- 5. In late December and early January 1978, field personnel attempted to remove water in the fuel system by the non-authorized procedure of adding alcohol to scavenge (eliminate) separated water in fuel tanks. Samples of suspect diesel fuel forwarded to this office were characterized as having two discrete phases; namely, alcohol and diesel fuel which is typical of alcohol-petroleum fuel mixtures where moisture is present. Upon receipt of these samples, FAMECE/UET personnel were subsequently advised as to the proper "diesel fuel anti-icer" specified in TM 9-207/TO 36-1-40 "OPERATION AND MAINTENANCE OF ORDNANCE MATERIEL IN COLD WEATHER," which states (under paragraph 1-31d(2)a) the following:

"Add Inhibitor, Icing, Fuel System (MIL-I-27686) to diesel fuel at the ratio of 1 pint of additive to 40 gallons

SUBJECT: Fuel Problems Associated with FAMECE Units

of fuel at the time of refueling. Fuel filters must be drained immediately after operation to remove additivewater mixtures from the bottom of the filters."

This inhibitor, referred to as FSII which is essentially ethylene glycol monomethyl ether, is presently under requisition for use in the remainder of the FAMECE DT-II testing program.

- 6. On 13 January 1978, the DUMPER Power Section experienced a noticeable power loss which was traced to plugging of the main (primary) fuel filter. Subsequent analysis of the contaminant indicated it to be principally iron oxide. The most probable cause of this contamination would be a result of rust formation occurring in the vehicular fuel tank or the fuel trucker assigned to the North Area.
- 7. A sample of diesel fuel was obtained from the truck delivery to No. 1 Storage Tank on 23 January 1978. Subsequent analysis revealed this delivery lot of product has a cloud point of  $24^{\circ}$  F which met the specification requirement of VV-F-800b (a  $24^{\circ}$  F maximum cloud point limit is required for the month of January). This inferred the previous problems to have been caused by contamination existing in No. 1 Storage Tank. In view of our RDTE responsibility in fuel decontamination, this office suggested a fuel separator be used and, subsequently, offered an available unit for property transfer to the North Area.
- 8. A series of diesel fuel samples were delivered to this office on 27 January 1978. These represented the first vehicular fuel samples after the January delivery. Subsequent analysis of these samples revealed a gradual improvement in fuel quality; however, it was noted that fuelalcohol contamination, water contamination, and rust continue to remain as an impairment to satisfactory fuel system performance. A summary listing of all fuel sample analysis, sampling dates, observations, etc. completed thus far is provided for your review in Incl 3. If further operational difficulties with FAMECE fuel system occur or if these units are to undergo future testing at other locations, draining and flushing of fuel tanks is strongly recommended.

(signed)

3 Incl

PAUL J. KENNEDY Chemist Fuels & Lubricants Division DRDME-GL Fuel Filter Sludge in FAMECE Power Unit

FAMECE/UET C, Fuels & Lubricants 28 Sep 77
DRCPM-FM-TM (Mr. H. Mayo) Kennedy/cc/44595

- 1. Reference is made to the fuel filter sludge sample collected on 22 Aug 77 as part of the oil analysis program.
- 2. This sludge consisted of 59% Iron Oxide and 1.5% Silica and contained only minimal amounts of fuel deterioration products. Further information on the chemical composition of this material can be found in the attached report of chemical and analysis.
- 3. Discussion with field personnel indicated that this problem surfaced after addition of new fuel to an underground storage tank. The chemical analysis indicates that the source of the sludge was the result of the mixing of tank corrosion products with the fuel oil.
- 4. Remedial action at the north area in response to this problem involved use of a fuel vehicle for distribution of fuel and conversion of the underground storage tank to gasoline. This corrective action has eliminated the fuel sludge problem.
- 5. If reuse of the original underground storage tank is planned, then installation of a fuel filter on the pump should be considered. Alternately, a significant reduction of sludge levels could be achieved by allowing approximately two days for particulate matter to settle out of the fuel after agitation.

(signed)

MAURICE E. LEPERA Chief, Fuels and Lubricants Division

Cincl 13

### U.S. ARMY FUELS AND LUBRICANTS RESEARCH LABORATORY 8500 CULEBRA ROAD-P.O.DRAWER 28510 SAN ANTONIO, TEXAS 78284

File: B-3

USAFLRL

9 September 1977

Commander

U.S. Army Mobility Equipment Research & Development Command DRDME-GL, Messrs. M.E. LePera and Paul Kennedy Ft. Belvoir, VA 22060

Re: Laboratory Report of Analyses for Sludge from FAMECE Vehicle Fuel Filter.

Dear Sir:

- The fuel filter sludge sample, coded AL-7075-X (received 6 September 1977, from your facility) was pentane washed, air and 210° F oven dryed. Only 0.4% of the dry sample was soluble in BAM. IR #1286 for the dry sample and IR #1284 for the BAM soluble portion of the sample are attached. Very little organic fuel deterioration products were present in the dry sample. No evidence of micro-biological debris was apparent. The XRF data for the dry AL-7075-X sample gave 0.4% Si, 0.2% S, and 41% Fe.
- The data in item (1) suggest that the filter sludge (a representative sample of dry AL-7075-X is enclosed) is primarily rust due to fuel tank corrosion.
- 3. It is suggested that additional filters be obtained and placed in individual one-gallon cans for shipment to AFLRL. Inspection of the fuel tank(s) for evidence of corrosion is also requested (to include photographic documentation).
- Further details or assistance will be provided as requested.

Very truly yours,

R.D. Quillian, Jr. Director

(signed)

Leo L. Stavinoha Sr. Research Chemist

RDQ/LLS/rr Attachment to Incl 1

### DEPARTMENT OF THE ARMY US ARMY GENERAL MATERIEL AND PETROLEUM ACTIVITY PETROLEUM FIELD OFFICE (EAST) NEW CUMBERLAND ARMY DEPOT, NEW CUMBERLAND, PA 17070

10 January 1978

STSGP-PE

SUBJECT: Quality Surveillance Test Results

Ft. Belvoir

USA Mobility Equip Research MF: MERADCOM Testing Area

Ft. Belvoir

and Devel Center Whse 335

Alexandria, VA 22314

- 1. Laboratory analysis of petroleum sample forwarded by your installation indicates:
  - Product meets specification requirements for tests performed.
- Product deviates slightly from specification requirements but is considered suitable for use.
  - c. \_\_\_\_ Product does not meet specification requirements. See remarks.
- Sample information:
  - a. Product: F.O. Diesel, DF2
  - b. Item Number: 1035-34
  - c. Lab Number: 1969 1970
  - d. Sample Number: 3958-78 3959-78
  - e. Lead Content (grams per gallon):
  - f. % Sulfur:
  - g. % Sulfur permitted by contract specification:
- 3. Remarks:
  - \* 3958-78 Diesel Fuel Sampled 14 Nov 1977
  - \* 3959-78 Diesel Fuel Sampled 14 Dec 1977

CF: HQDA (DAEN-FEU) Post Engineer

GEORGE R. MARTELLO

Chief, Petroleum Field Office (East)

(Inc1 2)

STSGP-PE FL 716 (Revised) 27 Jun 77

Fuel Quality Monitoring

		Cloud Point	Specification	
Sample Origin	Date Sampled	o <sub>F</sub>	Requirement	Remarks
Fuel Delivery Truck		24	36 Max	NCAD Sample 3958-78*
No. 1 Storage Tank		84	26 Max	. 1
Scraper Fuel Tank	14 Dec 77	97	26 Max	Unit experiencing starting problems
Scraper Fuel Filter Unit	14 Dec 77	95		
Fuel Delivery Truck	14 Dec 77	16	26 Max	NCAD Sample 3959-78*
No. 1 Storage Tank	14 Dec 77	64		. 1
No. 1 Storage Tank	11 Jan 78	97		•
Fuel Truck	14 Jan 78	97	24 Max	
Loader Fuel Tank	12 Jan.78	07		Alcohol phase noted
Loader Fuel Filter Unit	12 Jan 78	42		Alcohol phase noted
Dumper Fuel Filter Unit		87		Alcohol phase noted
Fuel Delivery Truck		24		. 1
No. 1 Storage Tank	25 Jan 78	38		1
No. 1 Storage Tank		36		1
Dozer Fuel Tank (Bottoms)		34		Separated water layer noted
Loader Fuel Tank	25 Jan 78	28		Alcohol phase noted
Dumper Fuel Tank	27 Jan 78	24		. 1
Dumper Fuel Filter Unit	27 Jan 78	24		Dirt contamination evidenced

\*Samples analyzed by New Cumberland Army Depot (NCAD)

APPENDIX C

# FINDINGS AND RECOMMENDATIONS

### MAJOR INCIDENTS

Suggested Correction	Install faster recovery compressor. Install larger air storage tanks. Relocate governor for easier access to adjustment.	Relocate drain valve	Hermetically sealed coil	Install heavier duty relay	Determine cause of problem and make appropriate correction	Determine cause of problem and make appropriate correction	Add locknut
Cause	Air supply insufficient to operate throttle foot valve and windshield wiper simultaneously	Drain valve located on underside of power section is vulnerable to damage	Defective shift solenoid (moisture enters coil causing short and eventual burn out)	Pitted relay contacts cause high resistance in circuit	Unknown; cracks 16"-18" long located 45" and 72" from left end of moldboard	Piston on disc brake seized and would not retract	Jam nut on throttle linkage loosens under vibration, allowing linkage to get out of adjustment
Incident	Brake throttle foot valve fails to operate	Automatic drain valve on reservoir broken off	Transmission fails to shift	Electrical relays malfunction	Grader moldboard cracked	Grader service brakes seize	Throttle stuck in high idle
	rd	2	9	4	5	9	7

APPENDIX C

# MAJOR INCIDENTS (Continued)

Suggested Correction	Change material (contractor furnished MWO at termination of test)	Redesign throttle pivot	Corrected (manufacturer installed redesigned pump)	Contractor furnished MWO	Contractor furnished MWO	Contractor furnished MWO	Add second hydraulic cylinder on opposite side of lockring	Determine cause of problem and make appropriate correction	Problem corrected (retrofit seal kit installed)
Cause	Throttle linkage rod ends disconnected as a result of excessive wear in ball end retainer	Stones wedged under throttle pedal	Crack in fuel pump housing	Vibration	Vibration	Wheels drifting down when vehicle is in work mode	Dirt between inner and outer ring	Vibration	Oil leaking from steering valve (defective seal)
Incident	Throttle stuck in high idle	Throttle stuck in high idle	Fuel leaking on engine	Fuel tank mounting bracket fractured	Hydraulic tank mounting bracket fractured	Dolly wheels/cylinders damaged	Coupling lockring jammed in locked position	Flared metal tubing on scraper hydraulic pump fractured	Operator's foot slips off brake pedal
	$\infty$	6	10	11	12	13	14	15	16

APPENDIX C

# MAJOR INCIDENTS (Continued)

Suggested Correction	Redesign pin t	ured Redesign stops	r Determine cause of problem and make appropriate correction	Additional mounting hardware/ locknuts	Redesign aner vent	Increase diameter of control rods or change material	Determine cause of problem and make appropriate corrections
Cause	Quick-disconnect pin fractured and fell apart	Grader axle stops fractured and separated	Lower bearings in grader transfer case failed	Vibration	Tire cleaners on S.D. Compactor bounce out of disengage position (cleaner assembly removed to prevent damage)	Rod diameter/material inadequate for load	Unknown
Incident	Dumper tailgate fell off	Grader power section oscillates	Power inadequate to drive grader	Mud cleaners on T.F. Compactor loosen (cleaner assembly removed to prevent damage)	Tire cleaners jam against tires; locking handle fractures	Loader control rods break	Scraper hydrostatic drive inadvertently shifts rear wheels into reverse while power section is travelling forward
	17	18	19	20	21	22	23

APPENDIX C

# MAJOR INCIDENTS (Continued)

Suggested Correction	Equip air system with alcohol evaporator	Determine cause of problem and make appropriate corrections
Cause	Condensation in air system freezes and prevents manifold valve from seating; throttle movement restricted; air system cannot charge to operating capacity	Power section lateral vibration
Incident	Delayed departure	Operator lost control of vehicle when negotiating turns and when descending grades
	24	25

APPENDIX C

# FINDINGS AND RECOMMENDATIONS

#### MINOR INCIDENTS

	Incident	Cause	Suggested Correction
1	Getting underway delayed	Slow buildup of air pressure	Use faster recovery compressor
2	Hourmeter records fast time	Voltage spike occurs when transmission shifts, causing meter to jump ahead	Add capacitor (field installation corrected problem)
8	Components damaged by end of grader blade	Blade does not clear components when moldboard is at extreme position	Add limit stop/switch to moldboard
7	Battery cable insulation cut by engine hood	Insufficient clearance between hood and cable	Reroute cables (contractor-furnished MWO corrected problem)
5	Dozer blade reflectors damaged when excavating	Location of reflectors	Relocate reflectors
9	Loader fender bracket fractured at weld	Fender flexing	Increase size of bracket or add additional bracket to reduce fender vibration
7	Mirror mounting bracket fractured	Brackets flexing under vibration	Heavier bracket
∞	Pivot pin in auxiliary steering control bracket fractured	Vibration	Redesign pin to increase surface area of weld

APPENDIX C

## MINOR INCIDENTS (Continued)

Suggested Correction	Change plunger arm material	Relocate rear floodlights; add taillight guard	Add tilt adjustment to lights
Cause	Excess wear in plunger arm groove	Operator turns off rear floodlights to eliminate blinding glare from rockguard	Front lights cannot be adjusted to illuminate area immediately in front of grader
Incident	Loader clam control plunger separates from plunger control	Taillights damaged when operator backed dumper into obstruction	Grader accidentally hits obstacles
	6	10	11

#### APPENDIX D

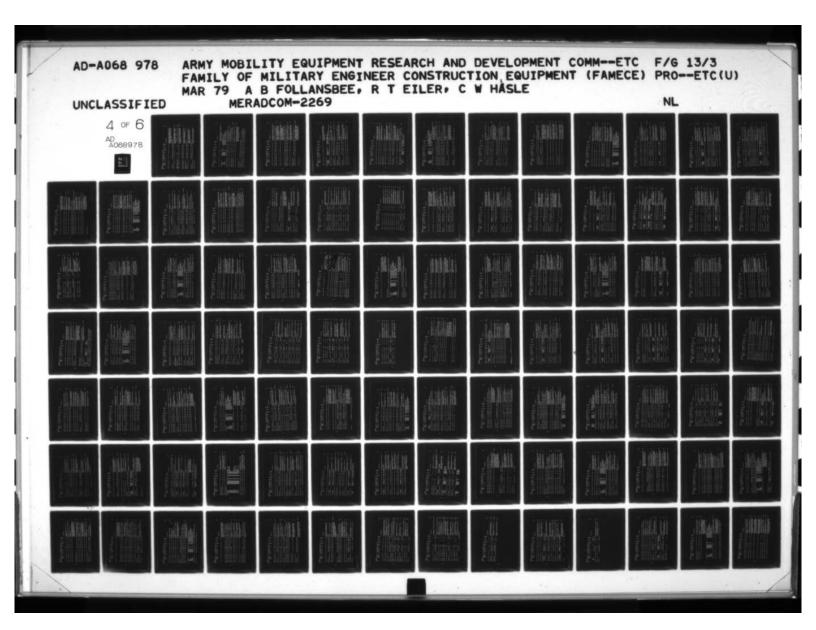
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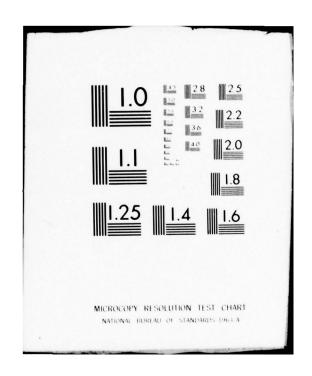
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EPR FB-35  ONE HAD TO RECONNECT RUBBER CONNECTOR  FROM TRANSHISSION HOUSING. EPR FB-35  HOUSING INTO SUPPORT BRACKET 2. THE  LIGHTS ON THE POMER SECTION ARE NOT LIGHTS NOT THE POMER SECTION ARE NOT CONNECTOR TO THE POMER SECTION AND	2. CHECK AIR FILTERS + CLEARD THEN - CHECK AIR FILTERS + CLEARD THEN - CHECK FULL FILTERS - CHECK FULL FILTER - SLUGGE AND HATER PRESENT IN FILTER HOUSING 4.  2.22-2216 GP=000010309 HO=D2 LIFE=UNK CARIRIDGE FULL FILTERS, EPR FB-34  2.7 017.0 UF F A C Y 0501 00.0 07.1 12.0 3 00.5 1. AS A RESULT OF AN ACCIDENT, THE RADIATOR FULL FILTERS - EPR FB-34  2.0 017.1 0 UF F A C Y 0501 00.0 07.1 12.0 3 00.5 1. AS A RESULT OF WAR ACCIDENT, THE RADIATOR FULL FULL FILTERS - EPR FB-35  3.3 018.0 U C C A C N N 0609 00.0 00.1 10.0 1. FIGHTEN FORDER FOLDER FRO-1051  3.3 018.0 U C C A C N N 0609 00.0 00.1 00.1 1 00.0 1. 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CHECK AIR FILERS + CLEANED THEN -  0. CHECK D STRAIRE - SLUDGE AND  MARER PRESENT IN FILER HUSING 4.  0. CHECKED STRAIRER - SLUDGE AND  MARER PRESENT IN FILER HUSING 4.  CLEANED SCREEN AND PRIMARY FILTER  HUSING AND CHANGED CAPTRIDGES IN THE  SECONDARY FILTERS. EPR FB-34.  10. UF F A C Y 0501 00.0 07.1 12.0 3 00.5 1. AS A RESULT OF AN ACCIDENT, THE  RADIATOR HAD TO BE REPLACED. A. SHIFT 1  2.6 HSS WITH AD TO BE REPLACED. A. SHIFT 1  2.6 HSS WITH AD TO BE REPLACED. A. SHIFT 1  2.6 HSS WITH AD TO BE REPLACED. A. SHIFT 1  3.6 HSS WITH AD TO BE REPLACED. A. SHIFT 1  4.6 HSS WITH A HAD TO BE REPLACED.  3.8 HIFT 2 4.5 HHS WITH 1 HAN WORKING 10 INSTALL RADIATOR 2. SHIFT 1  4.6 HSS WITH A HAD TO BE REPLACED. A. SHIFT 1  4.7 HSS WITH A HAD TO BE REPLACED. A. SHIFT 1  4.8 HSS WITH A HAD TO BE REPLACED. A. SHIFT 1  4.9 HSS WITH A HAD TO BE REPLACED. A. SHIFT 1  4.9 HSS WITH A HAD TO BE REPLACED. A. SHIFT 1  4.9 HSS WITH A HAD TO BE REPLACED. A. SHIFT 1  4.9 HSS WITH A HAD TO BE REPLACED. A. 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0 0 A C Y V 2402 00.0 02.4 02.4 10.0 INSTALLED NEW GROUND ORIVE PUMP. PUMP REPOYED TO RETURN TO MANUFACTURER FOR ENGINEER	D S OHR	A 1	S	-	E -	O A	1	C G CO	200	. 93	CH 2	E	-				E
U 0 0 A C Y N 1206 NO-0 01.2 0 02.0 1 00.0 INSTALLED NEW GROUND DRIVE PUMP. PUMP RECOVED TO RECOVER FOR FIGHT TO THE FOUND STEERING THE FLANGE TO THE PUMP BODY EAR FB-4.2  S C C A C Y N 0000 00.0 01.7 03.2 Z 00.0 PULLED 59 HOUR MAINTENANCE A. CHECKED THE FORM TO STEERING TO THE FROM THE FORM TO STEERING TO THE FORM TO STEERING TO THE FROM TO STEERING TO THE STEERING TO STOP LEAK. FPR FB-52 CHEROLOGY TO THE STEERING		3		v	I	I	S	ď	9		20	AO					۵
R S	T F 000	-	2	I		-	u	۵	ž		00	2					~
U 0 0 A C Y N 1410 00.0 02.0 1 00.0 INSTALLED NEW GROUND DRIVE PUMP, PUMP  ENGINEERING ANALYSIS BECAUSE OF FAILURE OF THO STUDS HOLDING THE FLANCE TO THE PUMP BOOV ER F8-42  S C C A C Y N 0000 00.0 01.7 03.2 2 00.0 PULLED 50 HOUR HAINTENANCE A. CHECKED HASTER CYLINDER RESERVORS LEVEL OK B. CHECKED IDHOUNT BEARING - LEVEL OK B. CHECKED VALVE COVER GASKET AGAIN. CF-0000111206 NO=01 LIFE=158.4 GASKET U 0 0 A C Y 1206 00.0 01.2 01.2 1 00.5 REPLACE PRESSURE SHITCH ON DECLUTCHING BRAKE OLD UNIT DANAGED DURING BERESS OF VALVE 3.75 ENGESS OF NEW VALVE 1.25 EPR FESSURE AIR LEAK. EERESS OF VALVE 3.75 ENGESS OF NEW VALVE 1.25 EPR FESSURE AIR LEAK. EERESS OF VALVE 3.75 ENGESS OF NEW FESSURE SHITCH ON ACCUMULATUR DUMP VALVE EPR	T HRS	z		~					-	1	S S	œ					s
GP=000011410 NO=01 LIFE=137.9 PUMP, GROUND STEERING  S C C A C Y N 0000 00.0 01.7 03.2 2 00.0 PULLED 50 HOUR MAINTENANCE A. CHECKED  HATTER CYLLHOER RESERVOIRS - LEVEL OK  B, CHECKED MIDHOUNT BEARING  GP=000010105 NO=01 LIFE=150.4 GASKET  U O O A C Y 1206 00.0 01.2 01.2 1 00.5 REPLACED PRESSURE SMITCH ON DECLUTCHING  BRAKE OLD UNIT DAMGED DUBING  BRAKE OLD UNIT DAMGED BUBING  BRAKE OLD UNIT DAMGED ON DECLUTCHING  BRAKE SHITCH  U O O A C Y 1206 00.0 05.0 1 02.0 REPLACE TREADLE VALVE ON DECLUTCHING  BGASSEMBLY OF TREADLE VALVE ON OCCUTCHING  BGASSEMBLY OF TREADLE VALVE ON OCCUTCHING  BGASSEMBLY OF TREADLE VALVE ON OCCUTUCHING  BGASSEMBLY OF TREADLE VALVE  U O O A C Y 2402 00.0 02.4 02.4 1 02.0 SOLOBRED LUG ON HIRE AND CONNECTED TO  FB. B, CHECKED TO BORD ON OCCUTUCHING ON OF OCCUTUCHING OF OCCUPULATOR DUMP VALVE EPR  FB. CHECKED TO THE OWN OCCUTUCHING OF OCCUPULATOR DUMP VALVE EPR  FB. CHECKED TO THE OWN OCCUTUCHING OF OCCUPULATOR DUMP VALVE EPR  FB. CHECKED TO THE OWN OCCUPULATOR DUMP VALVE EPR  FB. CHECKED TO THE OWN OCCUPULATOR DUMP VALVE EPR  FB. CHECKED TO THE OWN OCCUPULATOR DUMP VALVE EPR  FB. CHECKED TO THE OWN OCCUPULATOR DUMP VALVE EPR  FB. CHECKED TO THE OWN OCCUPULATOR DUMP VALVE EPR  FB. CHECKED TO THE OWN OCCUPULATOR DUMP VALVE EPR  FB. CHECKED TO THE OWN OCCUPULATOR DUMP VALVE EPR  FB. CHECKED TO THE OWN OCCUPULATOR DUMP VALVE EPR  FB. CHECKED TO THE OWN OCCUPULATOR DUMP VALVE EPR  FB. CHECKED TO THE OWN OCCUPULATOR DUMP VALVE EPR  FB. CHECKED TO THE OWN OCCUPULATOR DUMP VALVE TO THE OWN OCCUPULATOR DUMP VALVE TO THE OWN OCCUPULATOR	24/03/77 2 196.9	0500	>		4	> 0	z	1410		•	02.		12.0	-	00.0 INSTALLED NEW GROUND D REMOVED TO RETURN TO MAN ENGINEERING ANALYSIS BEC OF TWO STUDS HOLDING THE PUMP BODY EPR F8-42		3
S C C A C Y N 0000 00.0 01.7 03.2 2 00.0 PULLED 50 HOUR HAINTENANCE A. CHECKED HASTER CYLLNOER RESERVOIRS - LEVEL OK EN FB-1032  U C C I C Y Y 0000 1.5 4.5 3 HAD DIFFICULTY UNCOUPLING. EPR FB-1033  U D D A C Y N 0105 00.0 03.0 03.0 1 00.5 1. REPLACED VALVE COVER GASKET AGAIN.  CP-000010105 NO=01 LIFE=158.4 GASKET  U D D A C Y Y 1206 00.0 01.2 01.2 1 00.5 REPLACED PRESSURE SWITCH ON DECLUTCH ON DECLU	PARTS 2501959			EP.	000	011/	410	NO	011	. IFE	=137	9 6.	UMP	5	OUND STEERING		
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U 0 0 A C Y N 0105 00.0 03.0 1 00.5 1. REPLACED VALVE COVER GASKET AGAIN.  2. FOUND HOLE IN VALVE COVER REPAIRED MITH EPOXY. SEEMED TO STOP LEAK. EPR F8-50(12-1)  GP=000010105 NO=01 LIFE=158.4 GASKET  U 0 0 A C Y 1206 00.0 01.2 01.2 1 00.5 REPLACED PRESSURE SWITCH ON DECLUTCH  BRAKE OLD UNIT DAMAGED DURING DISASSEMBLY OF TREADLE VALVE EPR F8-52  GP=000011206 NO=01 LIFE=UNK PRESSURE SWITCH  U 0 0 A C Y N 1206 00.0 05.0 1 02.0 REPLACE TREADLE VALVE ON DECLUTCHING FEDAL; NO AIR PRESSURE, AIR LEAK. EGRESS OF VALVE 3.75 ENGRESS OF NEW VALVE 1.25 EPR F8-52  U 0 0 A C Y 2402 00.0 02.4 02.4 1 02.0 SOLDERE) LUG ON WIRE AND CONNECTED TO SOLENOID ON ACCUMULATOR DUMP VALVE EPR F8-54	15/08/77 1 200.5	21.0/R= 1.0(	>		-			0000			=		.5		HAD DIFFICULTY UNCOUPL	ING. EPR F8-1033	1033
GP=000010105 NO=01 LIFE=158.4 GASKET  U O O A C Y Y 1206 00.0 01.2 01.2 1 00.5 REPLACEO PRESSURE SMITCH ON DECLUTCH BRAKE OLD UNIT DAMAGED DURING DISASSEMBLY OF TREADLE VALVE EPR FB-52  GP=000011206 NO=01 LIFE=UNK PRESSURE SMITCH  U O O A C Y N 1206 00.0 05.0 1 02.0 REPLACE TREADLE VALVE ON DECLUTCHING PEDAL; NO AIR PRESSURE, AIR LEAK. EGRESS OF VALVE 3.75 ENGRESS OF NEW VALVE 1.25 EPR FB-52  U O O A C Y Z 402 00.0 02.4 02.4 1 02.0 SOLDERE) LUG ON MIRE AND CONNECTED TO FB-54	25/36/77 1 203.4	022.0				0		1105	1	0.0	03.		3.0		00.5 1. REPLACED VALVE COVE 2. FOUND HOLE IN VALVE C WITH EPOXY. SEEMED TO ST FB-50(12-1)	R GASKET AGAIN. OVER! REPAIRED OP LEAK. EPR	50(12-1)
U O O A C Y Y 1206 00.0 01.2 1 00.5 REPLACEO PRESSURE SWITCH ON DECLUTCH  BRAKE OLD UNIT DAHAGED DURING  DISASSEMBLY OF TREADLE VALVE EPR FB-52  GP=000011206 NO=01 LIFE=UNK PRESSURE SWITCH  U O O A C Y N 1206 00.0 05.0 1 02.0 REPLACE TREADLE VALVE ON DECLUTCHING  PEDAL: NO AIR PRESSURE, AIR LEAK.  EGRESS OF VALVE 3.75 ENGRESS OF NEW  VALVE 1.25 EPR FB-52  U O O A C Y Z402 00.0 02.4 02.4 1 02.0 SOLDERE) LUG ON WIRE AND CONNECTED TO  SOLDERED LUG DUMP VALVE EPR  FB-54	JARTS 5330-00-41	9-3205	-	=d9	000	010	105	NO	01	IFE	=158	9 4.	ASK	13			
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				10 34					73(15-2)	11	70 (7-1)				
				00.0 250 HR MAINTENANCE; ALL BREATHERS WERE CLEANEO BUT NOT REPLACED AS NONE WERE AVAILABLE. EPR F8-1034			CIL 2. ADDED 2	2.	00.1 CHARGE UP AIR SYSTEM EPR FB-73(15-2)	BULB IN COMPOSIT FRONT LIGHT	00.2 1. JAM NUT FELL OFF OF PARKING BRAKE AGAIN. REPLACED NUT AND READJUSTED THE PARKING BRAKES ALSO HOOKED UP GLAD	HANDS TO ANOTHER POWER UNIT AND CHARGED SYSTEM EPR F8-70(7-1)			
				O 250 HR MAINTENANCE; ALL BREATHERS W CLEANED BUT NOT REPLACED AS NONE WERE AVAILABLE, EPR FB-1034		۰	١ 2.	00.1 1. ADDED 2 QUARTS OF ENGINE OIL ADDED 2 QUARTS OF TRANSHISSION OIL	-730	RONT	ING USTER	0		OIL	016
				A S A	151	00.0 ADDED 5 QUARTS OF ENGINE CIL	E 01	SSIO	R F8	11 6	PARK EACJ	1 A		00.1 ADDED I GALLON TRANSHISSION OIL	00.1 ADDED 1 GALLON TRANSMISSION OIL
			1	CED CED	OIL, FULL FLOW OIL, BYPASS FILTER OIL, TRANSHISSION WATER, CORROSION RESIST FL, POWER CLUSTER	NEIN	ENGINE	F EN	H EP	HEOS	NO R	5		SHIS	SHIS
				0 250 HR MAINTENANCE; CLEANED BUT NOT REPLAC AVAILABLE. EPR F8-1034	FILTER ELEMENT, DIL, FULL FLOW FILTER ELEMENT, DIL, BYPASS CARRIDGE, FUEL FILTER FILTER ELEMENT, DIL, TRANSHISSION FILTER ELEMENT, MATER, CORROSION FILTER ELEMENT, FL, POWER CLUSTER	9 JO	TS E	TEA	rste	00	OFF SO H	HANDS TO ANOTHER POWE SYSTEM EPR F8-70(7-1)		RAN	TRAN
				TENA OT R	DIL, FULL FLOW OIL, BYPASS FILTER OIL, TRANSHISS WATER, CORROSI	215	DD.1 1. ADDED 2 QUARTS QUARTS TRANSMISSION	S OF	IR S	1 6	FELL	-70C		NO	NO
			NOI	TEP	B T B T B T B T B T B T B T B T B T B T	QUA	NSM	2 ART	4	100	LAC	FB		GALI	GALL
			DESCRIPTION	HR 0 Bu	OIL, FULL FO OIL, BYPASS FILTER OIL, TRANSH WATER, CORR	5 0	TR	2 90	35	00.0 REPLACED	A SE	101		0 1	0
			DESC	250 EANE		ADDE	1. A	1.0	CHAR	O REPLACE	AIN.	STER	و	ADDE	ADDE
			ì	9.0	FILTER ELEMENT, FILTER ELEMENT, CARRIDGE, FUEL FILTER ELEMENT, FILTER ELEMENT,	0.0	1.0	0.1 A	1.0	. o a	0.2 AG	4 %	GP=000011201 NO=02 LIFE=242.4 NUT, RETAINING	0.1	1.0
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				03.9 1	FILTER CARTRI CARTRI FILTER FILTER	2 8.00	00.3 1	1 2.00	91.5	00.1	1 5.00			1 4.00	1 2.00
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MAINTENANCE D S	•			01/03/77 1 253.3 024.0	PARTS	02/03/77 2 268.8 025.0	03/03/77 1 269.2 026.0	03/09/77 1 273.6 027.0	06/09/77 1 260.1 027.1 CRITICALITY FACTOR= 1.00	1 11/60/90	05/03/77 1 280.5 028.0	URITICALITY FACTOR: 1.00	PARTS UNKNOWN	06/09/77 1 281.1 029.0	19

07/09/77 1 293.5 031.0 U C C A C N N 0000 00.0 00.5 1 00.1 ADDED 2 GALLONS TRANSMISSION OIL

07/09/77 2 296.6 032.0 U C C A C Y N 0721 00.0 00.1 00.1 1 00.0 REINSFREED FRANSHISSION FILLER TUBE IN 74  107/09/77 2 296.6 032.0 U C C A C Y N 0000 00.0 00.3 00.3 1 00.1 ADDED 2 GALLONS OF TRANSHISSION OIL  107/09/77 2 296.6 032.0 U C C A C N 0000 00.0 00.3 00.3 1 00.1 ADDED 2 GALLONS OF TRANSHISSION OIL  107/09/77 2 311.5 034.0 S C C A C Y 0000 00.0 00.0 00.3 00.3 1 00.1 ADDED 2 GALLONS OF TRANSHISSION OIL  108/09/77 2 311.5 034.0 S C C A C Y 0000 00.0 00.0 00.6 10.1 SP PROPER CALONS OF TRANSHISSION OIL  108/09/77 2 311.5 034.0 S C C A C N 0000 00.0 00.0 00.2 00.2 1 00.1 SP PROPER CALONS OF TRANSHISSION OIL  108/09/77 2 311.5 035.0 U C C A C N 0000 00.0 00.2 00.2 1 00.1 TOPED NOT TRANSHISSION OIL  108/09/77 1 311.6 035.0 U C C A C N 0000 00.0 00.2 00.2 1 00.1 TOPED NOT TRANSHISSION OIL  108/09/77 1 313.4 037.0 U C C A C N 0000 00.0 00.2 00.2 1 00.1 TOPED NOT TRANSHISSION  108/09/77 1 333.4 037.0 U C C A C N 0000 00.0 00.0 0.0 0.2 00.2 1 00.1 TOPED NOT TRANSHISSION  108/09/77 1 333.4 037.0 U C C A C N 0000 00.0 00.0 00.2 00.2 1 00.1 TOPED NOT TRANSHISSION  108/09/77 1 333.4 037.0 U C C A C N 0000 00.0 00.0 00.0 00.2 00.2 1 00.1 TOPED NOT TRANSHISSION  108/09/77 1 333.4 037.0 U C C A C N 0000 01.3 01.3 10.3 10.0 TOPED NOT TRANSHISSION  108/09/77 1 333.4 037.0 U C C A C N 0000 01.3 01.3 10.3 10.3 10.0 TOPED NOT TRANSHISSION  108/09/77 1 333.4 037.0 U C C A C N 0000 01.3 01.3 10.3 10.3 10.0 TOPED NOT TRANSHISSION  118/09/77 1 333.4 037.0 U C C A C N 0000 01.3 01.3 10.3 10.3 10.3 10.0 TOPED NOT TRANSHISSION  118/09/77 1 333.4 037.0 U C C A C N 0000 01.3 01.3 10.3 10.3 10.3 10.3 10.3	TEST FAMECEI TEST ITEM 935 T S E E T Q A C G CO CH MH M OT A / C C M A M S R OL LO AO E IT S U H H * T F P NY OU NU N AM K R S T C CR R GE DESCRIPTION	IPTION	MFRN
00 U C C A C N N 0000 00.0 00.3 00.3 1 00.1 ADDED 2 GALLONS OF TRANSHISSION OIL  0 S C C A C N 0000 00.0 00.3 00.3 1 00.1 JAH NUT LOSE ON PARKING BRAKE  0 S C C A C Y N 0000 00.0 00.6 00.6 1 00.1 STORED N OFC. MAINT MANUAL ON POWER  1 STORTON. EPR F8-75 17-2)  1 S C C A C N 0000 00.0 00.6 00.6 1 00.1 STORED N OFC. MAINT MANUAL ON POWER  1 S C C A C N 0000 00.0 00.6 00.6 1 00.1 STORED STORED OFC. OR OFC. MAINT MANUAL ON POWER  1 S C C A C N 0000 00.0 00.2 00.2 1 00.1 STORED OFC. OR STORED OFC. OR O	C C A C Y N 0721 00.0 00.1 00.1 1		z
0 S C C A C Y N 0000 00.0 00.6 00.6 1 00.1 50 HOUR HAINTENANCE PERFORMED A. CHECKEN HASTER CYLINDER RESEVOIR-ADDED 150-200 BLAS OF FLUID 8. CHECKED MINOMUNI BRARING-CC. ADDED 2 GALLONS OF HYDRAULIC SYSTEM OIL 0. PERFORMED 10 HYDRAULIC SYSTEM OIL 0. PERFORMED 10 HOUR LUBE ALSO EPR F8-1035  0 U C C A C N N 0000 00.0 00.2 00.2 1 00.1 IIGHTEN NUT ON ROTARY MAINFOLD TO STOP A SEEPAGE IN THE CAB OF THE VEHICLE EPR F8-106  0 U C C A C N Y 1414 00.0 00.2 00.2 1 00.1 IIGHTEN NUT ON ROTARY MAINFOLD TO STOP A SEEPAGE IN THE CAB OF THE VEHICLE EPR F8-106  0 U C C A C Y 1208 00.0 04.5 4.5 1 00.5 1. REPLACED FRONT OUTPUT SHAFT SEAL HANDLA CAS. THIS STEM IS NOT IN THE HANDLA CAS. THIS STEM IS NOT IN THE HANDLA CAS. THIS SYSTEM OF ANOTHER FAMECE IN ORDER TO CHARGE UP THE ALS SYSTEM OF ANOTHER FAMECE IN ORDER TO CHARGE UP THE ALS SYSTEM OF ANOTHER FAMECE IN ORDER TO CHARGE UP THE OUTPUT BULDO AIR PRISSORE IN THE DUMPER THIS PRISSORE IN THE DUMPER FOR SYSTEM SYST	C C A C N N 0000 00.0 00.3 00.3 1 00.	Z GALLONS OF TRANSHISSION OIL UT LOOSE ON PARKING BRAKE Y, NUT TIGHTENED PARKING BRAKE D. NO PART NUMBER FOR JAM NUT IN ORG. MAINT MANUAL ON POWER . EPR F8-75 (7-2)	75(7-2)
0 U.C.C.A.C.N.N.0000 00.0 00.2 00.2 1 00.0 ADDED 1.5 GALLONS OF TRANSHISSION OIL 0 U.C.C.A.C.N.N.0000 00.0 00.3 00.3 1 00.1 TIGHTEN NUT ON ROTARY HAINFOLD TO STOP 4 SEEPAGE IN THE CAB OF THE VEHICLE EPR FB-106 0 U.F.F.I.C.Y.V.0710 00.0 04.5 4.5 1 00.5 1. REPLACED FRONT OUTPUT SHAFT SEAL 8 ECAUSE OF LEAKAGE 2. THIS ITEM IS NOT IN THE HAC 3. THIS ACTION IS NOT IN THE HAWUAL EPR FB-108 0 U.C.C.I.C.Y.1208 00.0 01.3 01.3 1 00.2 1. CONNECTED GLAD HANDS TO AIR SYSTEM OF ANOTHER FAHECE IN ORDER TO CHARGE UP THE AIR SYSTEM IN THE DUMPER THEN WE LOST AND COULD NOT BUILD AIR PRISSURE IN THE DUMPER EPR FB-122(73-1)	C C A C Y N 0000 00.0 00.6 00.6 1	UR HAINTENANCE PERFORMED A. CHECK CYLINDER RESEVOIR-ADDED 150-200 FLUID B. CHECKED MIDHOUNT - G. ADDED 2 GALLONS OF IC SYSTEM OIL 0. PERFORMED 10 BE ALSO EPR F8-1035	1035
04 U C C I C Y 1414 00.0 00.2 00.2 1 00.1 FIGHTEN NUT ON ROTARY MAINFOLD TO STOP  # SEEPAGE IN THE CAB OF THE VEHICLE EPR FB-106  # U F F I C Y Y 0710 00.0 04.5 4.5 1 00.5 1. REPLACED FRONT OUTPUT SHAFT SEAL  # RECAUSE OF LEAKAGE 2. THIS ITEM IS NOT  IN THE HAC 3. THIS ACTION IS NOT IN THE  # HAHUAL EPR FB-108  # OF BOORD AND STOP OF THE SYSTEM  # OF ANOTHER FAMECE IN ORDER TO CHARGE UP  THE AND COULD NOT BUILD AIR SYSTEM  LOST AND COULD NOT BUILD AIR PRISSURE  IN THE DUMPER EPR FB-122(73-1)	A C. N. N. 0000 . 30.0 . 00.3 . 00.3	1.5 GALLONS OF TRANSMISSION OIL ONE QUART ENGINE_OIL	
OUFFICY OF 10 00.0 04.5 4.5 1 00.5 1. REPLACED FRONT OUTPUT SHAFT SEAL BECAUSE OF LEAKAGE 2. THIS ITEH IS NOT IN THE IN THE MAC 3. THIS ACTION IS NOT IN THE MAUDAL EPR FB-108  OF THE FB-108  OF THE MAC 3. THIS ACTION IS NOT IN THE MAC 1.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	0 0 A C Y 7 1414 00.0 00.2 00.2 1	HAINFOLD TO THE VEHICLE	106
GP=00001010 NO=01 LIFE=UNK SEAL (FRONT OUTPUT SHAFT OF TRANSMISSION)  0 U C C I C Y Y 1208 00.0 01.3 01.3 1 00.2 1. CONNECTED GLAD HANDS TO AIR SYSTEM  1 THE AIR SYSTEM IN THE DUMPER. THIS  PROCEDURE WORKED ONCE BEFORE WHEN WE LOST AND COULD NOT BUILD AIR PRISSURE IN THE DUMPER EPR F8-122(73-1)	00.0 04.5 4.5_1	PLACED FRONT OUTPUT SHAFT SEAL OF LEAKAGE 2. THIS ITEM IS NOT HAC 3. THIS ACTION IS NOT IN THE EPR FB-108	108
0 U C C I C Y Y 1206 00.0 01.3 01.3 1 00.2 1. CONNECTED GLAD HANDS TO AIR SYSTEM OF ANOTHER FAMECE IN ORDER TO CHARGE UP THE AIR SYSTEM IN THE DUMPER, THIS PROCEDURE MORKED ONCE BEFORE WHEN WE LOST AND COULD NOT BUILD AIR PRESSURE IN THE DUMPER EPR FB-122(73-1)	- 4	SHAFT OF TRANSMISSION)	
	C C I C Y Y 1208 00.0 01.3 01.3 1	NNECTED GLAD HANDS TO AIR SYSTEM HER FAMECE IN ORDER TO CHARGE UP SYSTEM IN THE DUMPER, THIS RE WORKED ONCE BEFORE WHEN WE D COULD NOT BUILD AIR PRESSURE	122(73-

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10		SE	UESSKIPTION	00.2 50 LUB. (SPEND TWO HOURS COUPLING + UNCOUPLING) 10 HR LUBRICATION 2 QTS ENGINE DID ADDED 6 ML OIL TC FRONT MOMING ADDRESS 129		YY, BREATHER, MOMT YY, BREATHER, AXLE YY, BREATHER, TRANSHISSION	00.1 ADDED 2 GALLONS HYDRAULIC FLUID TO THE TANK	00.0 REPLACED BULB IN ROADSIDE CLEARANCE LIGHT (AH3ER) EPR F8-135	BULB, INCANDESCENT	00.0 REPLACED BURNED OUT LEFT HEADLIGHT EPR F8-134		DO.D ADDED 2 GALLONS OF HYDRAULIC OIL	00.5 REPLACED PARKING BRAKE CABLE OLD CABLE WAS DAMAGED ADJUSTED PARKING 9RAKE EPR FB-136	REMOTE ACTUATOR	00.0 REHOVED FILLER NECK ASSY AND PACKING - CLEAN AND RE-INSTALL, POSSIBLE CAUSE OF LEAK MAS PACKING. EPR F8-14-2.	00.0 ADDED 1 GALLON OF OIL TO THE TRANSMISSION	00.0 50 HOUR MAINTENANCE. EPR F8-1036
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			DESCRIPTION	00.0 CURBSIDE DOLLY WHEEL UPPER SUPPORT Bracket Broke. Installed nut and Bolt to secure dolly wheel. EPR F8-176	00.0 ADJUST AND ITCHTEN ALTERNATOR BELTS THE BELTS WERE LOOSE EPR F8-178	00.5 REATTACHED THROTTLE LINKAGE; IT HAD VIBRATED APART. NO PARTS REFLACED. EPR FR-179	The second secon	88.8 ADDED 1 GALLON OF OIL TO THE TRANSMISSION	00.1 PERFORMED 50 HOUR LUBRICAJION A. ADDED 2 OZ BRAKE FLUID TO THE POWER CLUSTER RESERVOIR 8. ADDED 12 ML OIL TO MASTER CYLINDER EPR F8-1037	80.1 REPLACED BOLT-ONE ON FUEL TANK MOUNTING BRACKET, EPR F8-206	00.1 REPLACED SURGE TANK MOUNTING BOLT. EPR FB-210	CAP HEXHEAD, PHOS CTE. 3/8-16 UNC. 1 IN. LE.	00.0 BENJ BRACKET DIT PPOP. DISC BRACKET BENT- COULD NOT SHIFT THE PROP DISC ROD ASSY - THE BRACKET WAS RE-BENT BACK IN POSITION EPR FB-213	FRANSHISSION ADDED 2 GALLONS OF HYDRAULIC OIL	00.1 AUDED 1 GALLON TRANSMISSION OIL	00.0 500 HOUR MAINTENANCE EPR FB-1036	ENT, OIL, FULL FLOW Ent, OIL, BYPASS FUEL FILTER
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PARTS HSN4820-00-420-6194 GP=000011208 NO=02 LIFF=UNK	24-00-45	0-61	76	2	900	1115	99	0=0	2 1.1	FF =	X	VAL	1,	DRAI	K CA	12 8	RAKE	VALVE, DRAIN (AIR BRAKE SYSTEM)	LEN)						
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PARTS 18425				9:4	00	1115	16	0=0	GP=000011507 NO=01 LIFE=UNK	F1 =	HK	FII	1116	FITTING, LUBRICATION	9816	AT 10					-			1	1
06/10/77 2 565.6		053.04 U O O I C N N 2407	5	0	-	2	2 2	6	9		5.00 00.00	99.5	-	:	MHEEL ASSY 2 ELIMIN EXPERI	STAL CCY 29, INAT	2428 2428 6 TH	VALVE 6-151	IN S	ERCH SPS 8.	MHEEL CYLINDERS, IN SERIES WITH HOSE ASSY 29,24,2R6-JSN6- J9950, THIS IS TO ELIMINATE THE DOLLY WHEEL CREEP EXPERIENCED BY ALL POWER SECTIONS EPRF8-240	DOLLY HOSE IS TO	0 0	2	540
PARTS UNKNOWN			0	9 2 0	000	124	1 10	0=0	GP=000012407 NO=02 LIFE=UNK	FEE	N.	VAL	1.5	VALVE, SHUT OFF	990										
06/10/77 2 571.6		0.750	5	0	4	2			U C C A M M N 0000 00.0 00.1		1.1	1 1.00	-		0 A 0	030	1 00	194	N3 JC	88.8 ADDED I QUART OF ENGINE OIL	0.11				

		a	œ	'n	-	235			1039	1839				1040		252		
	10			35		08.9 00.2 00.2 1 90.0 REPLACES BURNED OUT LAMP IN RIGHT TAIL LIGHT EPR F8-235	LAMP, INCANDESCENT	88.5 1 88.8 ADD 2 GALLONS OF COOLANT TO FILL RADIATOR	50 HR HAINTENANCE. EPR FG-1039	DIFFICULTY UNCOUPLING. EPR F8-1819	99.9 INSTALLED CANVAS CAB ASSEMBLY. ITMOEPS- -201-20-P INDOCOUATE- TH STATES THE PERTIMENT CANVAS CAB ILLUSTRATIONS FIG 2-170, PAGE 2-800, FIG. 132, PAGE C-172 SHALL BE SUPPLIED LATER.)	GP=000012201 NO=01 LIFF=0000 CAS ENCLOSURE-SOFT	88.8 ADS 1 GALLON OF HYDRAULIC OIL	U C C A M M M 8306 66.6 66.1 00.1 1 80.8 TICHTENED BOLT FOR SECURING FUEL TANK AGAINST THE FRAME. EPR F8-1046	99.9 DURING POST OPERATIONAL CHECK OF VEHICLE, CREW ADDED 4015 OF HYDRAULIC FLUID.	88.8 REPLACE LEFT FLOOD LIGHT ON ROPS EPR F8-252	LAMP, FLODOLIGHT	PERFORMED 59 HR MAINTENANCE PER LUGE ORDER LOS-3849-201-12. DURING 59 HOUR MAINTENANCE, 10 SQUIRTS OF CE/HO/ MAS ADDED TO THE MIDMOUNT BEARING, EPR
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OT III AM GE OESCRIPTION	00.0 ADDED 1 GAL. OF TRANSMISSION FLUID. 00.0 REPLACE BURNED OUT LAMP IN SERVICE HEADLIGHT.EPR F8-249	190.2 1 00.1 REWELDED FRAME BRACKET FOR MOUNTING FUEL TANK, BRACKET, LOCATED IN PROXIMITY RADIATOR AIR INLET, SEPARATED BETWEEN THE FRAME AND THE POSITION WHERE IT IS BOLTED TO THE FUEL TANK, BRACKET IS NOT SHOWN IN THE IN 10EP 5-	TIRE PRESSURE MAS LOW AT 50 PSI.  INFLATED BOTH DOLLY WHEELS TO 90 PSI.  TIRE PRESSURES WERE LOW AT 60 PSI.	00.0 TIGHTFNEO BOLTS USED TO MOUNT THE SURGE TANK TO THE BRACKET ASSEMBLY. EPR	00.0 DURING PRE-OPERATIONAL CHECK, OPERATOR TIGHTENED BOLTS ON THE ENGINE ACCESS PANEL, LOCATEDIIN THE RIGHT FRONT WHEEL WELL, EPR F9-259	01.0 TIGHTENED MOUNTING AND ADJUSTING BOLTS ON FAN PULLEY AND MUB ASSEMBLY. EPR F8-260	00.0 FAN WHEEL IS HITTING FAN RING OR Shroud, mechanic retightened adjusting Bolts on Fan Hub Assembly. EPR F8-261	99.0 DURING PREOPERATIONAL CHECK, THE BOLTS, FOR SECURING THE HYDRAULIC TANK TO THE FRAME, WERE TIGHTENED. EPR F3-262
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		DESCRIPTION	00.0 DURING PRE-OPERATIONAL, 1 GAL OF HYDRAULIC FLUID WAS ADDED TO THE HYD. TANK.	PERFORMED SO HOUR MAINTENANCE PER LUBE ORDER LOS-3840-201-12. EPR F8-1042	DIFFICULTY UNCOUPLING (3 PEN X 50 MIN). RESET CYLINDER PRESSURE TO 2500 PSI (1 MAN X 15 MIN), EPR F8-1042	00.0 DURING POST OPERATIONAL CHECK OF VEHICLE, CREW ADDED 2 9TS OF ENGINE OIL.	00.0 REPLACE BURNED OUT LAMP. EPR F8-269		00.0 WELDED HODIFICATION BRACKET TO FRAME TO SUPPORT THE TOP OF THE FUEL TANK EPR F8-268.	00.0 WELD BRJKEN TOP + BOTTOM HYDRAULIC Mounting Brackets epr FB-269	00.0 250 HP HAINTENANCE 32 QTS OF OE30 ENGINE OIL DIFFERENTIAL AND PLANETARIES ORAINEO AND REFILLED, LUBRICANT CONTAMINATED MITH MATER, EPR F8-1044	FILTER ELEMENT, OIL, FULL FLOW FILTER ELEMENT, OIL, BYPASS CARTRIDGE, FUEL FILTER FILTER ELEMENT, OIL, TRANSMISSION FILTER ELEMENT, WATER, CORROSION RESIST FILTER ELEMENT, HATER, CORROSION FILTER ELEMENT, FL, POWER CLUSTER FILTER ELEMENT, FL, POWER CLUSTER VENT ASSY, BREATHER, MOHT VENT ASSY, BREATHER, TRANSMISSION
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DESCRIPTION	00.0 ADDED I GALLON TRANSMISSICM/OIL	00.0 TIGHTEN 2 RADIATOR HOUNTING SCREWS THAT WERE LOOSE - CHECKED FOR HOPE LOOSE SCREWS BUT FOUND NONE EPR F8-271	00.0 ADD 2 QUARTS OF ENGINE OIL	00.0 ADD 1 1/2 GALS OF COOLANT TO THE REDIATOR	00.0 REPLACE DEFECTIVE DIPSTICK EPR FB-265 (S-1)		00.8 2 00.2 REPLACE OIL PRESSURE GAGE EPR F8-272	GAGE, OIL PRESSURE	00.0 1. ADDED I GALLONS OE-10 TO HYDRAULIC TANK 2. ADDED U GALLON ANTIFREEZE MIX TO COOLING SYSTEM	DO.O REPLACEO CAPSCREM IN ADJUSTING CLAMP ON FAN HUB SHAFT. CAP SCREM + MASHER MISSING. DEPS-201-0J +P PG9-110 FIG. 45 ITEH 7+6		0.0 INSTALLED AS A TEMP, FIX, A PETCOCK VALVE TO BY PASS A BAD VALVE IN THE MINOSHIELD WIPER ASY EPR FB-277	00.0 ADJUST PARKING BRAKE, BRAKE WAS OUT OF ADJUSTMENT. TOO LOOSE EPR F8-276	00.0 00.1 00.1 1 00.0 TIGHTEN KHOB HOUNTING SCREW ON AIR CONTROL ASSY EPR F8-278
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	-				-		¥	O REPLACED CUSUSIDE DOLLY CYLINDER HOUNTING BRACKET ASSY, EPR F8-176(S-1)			00.0 AUJUSTED SERVICE BRAKES EPR FB-345		E	9		00.0 REINSTALLED ORIGINAL HOUR HETER PART NJ. 2549166 EPR FB-726	LEVEL IN PLANETARY PLUG, LEFT FRONT	DO.O ADDED 1 GAL OF TRANSHISSION FLUID TO THE DUMPER POWER SECTION DURING POST
	-					PERFORMED 50 HR HAINTENANCE PER ORDER LOS-3840-201-12 EPR FB-1043	00.0 WELD CRACKED ROADSIDE FUEL TANK HOUNTING BRACKET EPR F8-1054	00.0 REPLACED CUGUSIDE DOLLY CYLINDER HOUNTING BRACKET ASSY, EPR F8-1761		00.0 ADJUST SERVICE BRAKES ON PS-THE BRAKES HERE OUT OF ADJUSTMENT EPR FB-345	P.0 F	ICE	00.1 ADDED 2 QUARTS OE-30 TO ENGINE	FB-726	1	HET	EFT	A NO
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0440	1 00.0 ADDED 11/2 GALLON OE-10 TO HYDRAULIC TANK 1 DD.0 ADDED 1 GALLON TRANSHISSION FLUID 1 00.0 REPLACED CAPACITOR ON HOURHETER EPR	00.	2 00.0 INSTALLED BACK UP ALARM. EPR FB-340 1 00.0 ADDED 1 GALLON OF ENGINE OIL 1 00.1 ADDED 6 QUARTS OF ANTIFREEZE MIX TO COOLING SYSTEM. 1 00.1 REPLACEO TWO(2) LOST BOLTS IN SURGE TANK MOUNTING BRACKETS EPR FB-349	SCREW, CAP, HEX HEAD PHOS CTG 3/8-16 UNC 11/4 IN. LG HASHER FLAT PHOS CTG 3/8 IN. ID 15/16 IN D NUT, SLFLKG, HEXAGON PHOS CTG, 3/8-16 UNC 03.0 3 00.0 50 HR. LUB LO 5-3840-201-2 EPR FB-350 00.1 1 00.0 ADDED 6 QTS OF TRANSHISSION OIL.	01.5 1 00.2 REP_ACED 3RD GEAR SOLENOID COIL EPR 661 FB-661 SGREMOID-3RD GEAR ELECTRIC CONTROL VALVE ON TRANSHISSION.
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	9 #L	v					TANK	1CE	:	LOOSE FILTER ELEMENT IN MATER EPR FO-667	REHOVE	5 .
	00.0 PERFORMED SO HR MAINTEMANCE ADDED 9 OF LUBRICANT TO MID MOUNT 2 HEN 50 MINUTES TO UNCOUPLE 2 HEN 15 MINUTES RECOUPLE 2 HEN 30 MINUTES MAINTENANCE EPR F8-663	00.1 ADDED 4 GALLONS DE-10 TO HYDRAULIC RESERVOIR.	HYDRAULIC TANK RE-INSTALL EPR	ING			HYDRAULIC	0	1 REMOVED FUEL FILTER ASSEMBLY AND CLEANED, REINSTALLED FILTER ASSEMBLY. PART 8M-34627 EPR F8-598	N.	S. S.	WIRING, ZHSTALL NEW MOUNTING BRACKET X 4 X 3/8 MADE IN SHOP! - RE-INSTALL TANK + FENDER - RE CONNECT ALL LINES
	O PERFORMED SO HR MAINTENANCE ADDE OF LUBRICANT TO HID HOUNT 2 HEN 50 MINUTES TO UNCOUPLE 2 HEN 15 MINUTER RECOUPLE 2 HEN 30 MINUTES MAINTENA EPR FB-663	YOR	ALL.	PT			DRA	THROTTLE LOCK OUT SYSTEM - REMOVED THROTTLE LOCK OUT SYSTEM - REMOVED AND CLEANED CYLINDER, REINSTALLED CYLINDER EPR F8-597	00.1 REMOVED FUEL FILTER ASSEMBLY AND CLEANED, REINSTALLED FILTER ASSEMBL PART BM-34827 EPR FB-598	HEN	O REPAIRED TOP MOUNTING BRACKET ON HYDRAULIC TANK, (REMOVE FENDER - R. MYD. AND TANK TANK TANK TANK TANK TANK TANK TANK	INS
	NANG N 1 2 N 1 1 5	2	RAUL INST	SIZE, OPER	_	110	± 2	CYL)	FER	ELE	END	RE
	HOUNT 2 HEN	9	RE-	MET ZE, ZE, LTS, LTS	00.0 ADDED 1 GAL. ENGINE DIL	00.0 ADDED 2 QUARTS ENGINE OIL	BRACKETS EPR F8-666(269-2)	AT TEN	FIL 598	TER.	S A S	15. 2NSTALL NEW HOUNTINGS 378 MADE IN SHOP) - RE
	HIN	- 9e	00.0 MELD, BROKEN LOWER MOUNTING BRACKET AND FB-664 (269-1)	SI	INE	NGI	9 80	SYS SYS	1 REMOVED FUEL FILTER AS CLEANED, REINSTALLED FIL PART 8M-34827 EPR F8-598	LOOSE FILT EPR FO-667	MYDRAULIC TANK. (REHOVE	2 ± 5 S
	OF PERFORMED SO HR MA OF LUBRICANT TO MID MINUTES TO UNCOUPLE RECOUPLE 2 MEN 30 MI EPR FB-663	ONS	ETO	LIKE HO	EN	TS	ANG B-66	TYD OUT LIN	TALL	OSE R F	5.5	HIRING, ENSTALL NEXT X X X 378 MADE IN
3	SO CNC CNC	ALL	ACK 1	SE SE	A.	UAR	TOP R F	32.2.	UEL INS 27		ANK	TAL
DESCRIPTION	CAN TO TO 63	* 6	0_WELD, BROKE HOUNTING BRAC FB-664 (269-1)	O REPLACEO CLI SUBSTITUTE OF YOLTAGE, RANGE FB-726 (S-2)	9	2 0	C E	LO P	348	2 TIGHTENED FILTER ASSY	5	2NS 8 H END
SCRI	O PERFORMED OF LUBRICAN MINUTES TO RECOUPLE 2 EPR FB-663	1 ADDED 4 RESERVOIR	11 NG	O REPLACED SUBSTITUTE VOLTAGE RAN FB-726 (S-2)	0.30	030	MELC SETS	MOVE NOER	NED,	ER I	AULI	, j
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		1.0	9	SUBSTITUTE SUBSTITUTE VOLTAGE. RAN FB-726 (S-2)	0.00	0.0	00.0 REMELDED TOP AND BRACKETS EPR F8-666	D0.2	1.0	00.2 TIGHTENED FILTER ASSY	0.5 H 1	
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CRIFICALITY FACTOR= 1.00

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			DESCRIPTION	00.1 TIGHTENED FITTING, STEEL TUGING ON GROUND STEER PUMP RELIEF VALVE, EPR FB-511	88.1 ADDED 1 QUART DE-18 TO TRANSHISSION SUMP	00.1 ADDED 5 GALLONS DE-10 TO HYDRAULIC RESERVOIR.	00.1 PACKING, PREFORMED PART 50K-267 LEAKING, REPLACCHENT NOT AVAILABLE, SUBSTITUTED AVAILABLE SIMILAR PART RECOMMENDED PART MILL BE INSTALLED WHEN AVAILABLE EPR F8-486	80.1 ADDED 5 GALLON HYDRAULIC FLUTO	00.0 ADDED 5 GALLONS OF HYDRAULIC DIL - BECAUSE OF GASKET LEAK IN HYDRAULIC TANK.	00.0 TIGHTENED SMIYEL ELBON ON TOP OF ACCUMULATOR ADDED 9 GALLONS HYDRAULIC DIL EPR F9-517	00.0 SERVICED FUEL FILTERS TOOK FUEL SAMPLE EPR F8-544	00.0 PERFORMED 1000 HOUR MAINTENANCE EPR FB-555	MT. DIL, FULL FLOW		NT, OIL, TRANSMISSION	ELEMENT, FL. POWER CLUSTER	VENT ASSY, BREATHER, MOMT	VENT ASST, SKEATHER, ANDE	FILTER ELEMENT HYDRAULIC RESERVOIR
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					S			DESCRIPTION	
17/01/78 1 01054 198.0A	S 0 0 A	>	6090 N	00.00	00.1	00.1 1		00.0 REPLACED LAMP IN LEFT REAR FLOODLIGHT EPR FB-554	155
PARTS 4880	GP = 000	9010	=0N 60	GP=000010609 NO=01 LIFE=	==	LAMP,	FLO	LAHP, FLOODLIGHT	
18/01/78 1 01072 109.0	W 0 0 0	> 0	0000 N A	0.00	9.00	01.0	2	00.0 UNCJUPLEO FROM DUNPER SETION T-936 EPR FB-559	655
18/01/78 1 01072 109.0A	U C C A	2 0			0.0	1.6	~	COUPLED TO DUMPER WORK SECTION T-942 HAD TROUBLE DUE TO ICY CONDITIONS EPR	653
CRITICALITY FACTOR= 0.50								FB-559	
18/01/78 2 01073 110.0	UCCA	z	0000 N	0.00	00.1	00.1 1		00.0 ADDED 1 GALLON OF HYDRAULIC OIL	
19/01/78_2 01080 111.0	U 0 0 A M Y N 0106	H Y	0100	0.00	2.00	00.2 1	1	OD.O INSTALL NEW GASKETS IN FULL FLOW OIL FILTERS EPR F8-565	595
PARTS - 24503	GF = 000	01010	16 NO=	02 LIF	E=261.9	GF=000010106 NO=02 LIFE=261.9 GASKET			
19/01/78 1 01080 111.0A	UCCA	Z	0000 N	0.00	2.00	2.00	1 0	00.0 ADDED 5 GALLONS HYDRAULIC OIL	
20/01/78 2 01083 112.0	O C C	z	N 2408	0.00	00.3	00.3	-	00.0 REPLACE + INSTALL NEW PACKING IN HYDRAULIC FILLER ASSEMBLY - OLD PACKING MAS LEAKING EPR F8-560(486-1)	560 (496
PARTS 58K-267	6P=000	101240	=0N 80	GP=000012408 NO=01 LIFE=UNK	E=UNK	PACKING,		PREFORMED	
23/01/78 2 01111 113.0	0 0 0 A	>	Y 0612	0.00	2.00	7.00	2	00.0 TAPE WORN INSULATION ON BATTERY CABLES EPR F8-591	165
25/01/78 2 01133 114.0	UCCA	z	0000 N	00.00	00.2	00.2 1		00.0 ADDED 3 QUARTS OF ENGINE CIL	
25/01/78 2 01133 115.0	UCCA	Z	0000 N	0.00	00.5	00.2.1		00.0 ADDED 1 GALLON OF TRANSMISSION OIL	
28/01/78 2 01171 116.0	0 0 0 A	> E	N 1802	0.00	00.5	2.00	-	00.0 REPLACED CAP SCREWS IN ROADSIDE SIDE COVERS EPR F8-623	623
PARTS 17C-616H	GP = 000	0118	12 NO=	GP=000011802 NO=07 LIFF=		SCREW, CAP	CA		

,	E	4	× 0		634	635	629	637	705(269-3		3.7			662	100	209
				DESCRIPTION	88.1 REPLACED CONNECTOR ON END OF WIRE TO THE ENG OIL PRESSURE SENDING UNIT, PART 2548815 EPR FB-634	00.1 REVERSED ONE ALTERNATOR BELT AND ADJUSTED BELTS. PART NO. 217695 EPR F8-635	00.0 TAPED WIRE AND REINSTALLED PANEL LAMP EPR F0-629	01.2 CLEANED FROZEN SOIL FROM AROUND LOCK RING ASST READJUSTED LOCKING PRESSURE TO 700 PSI PERFORMED 50 HOUR SERVICE EPR F8-637	00.0 WELDED BOTTOH HYDRAULIC RESERVOIR BRACKET E?R F8-705(269-3)	88.0 ADDED 2 GALLONS HYDRAULIC OIL	REPLACEMENT ENGINE FROM MTSP UNDER WARRANTY WORK COMPLETED BY CUMMINS SERVICE PERSONNEL, ENGINE INSTALLED AT 1251.0 HRS. EPR FB-746	80.0 ADDED 1 GALLON ENGINE OIL	00.1 ADDED 3 GALLONS OF OIL TO ENGINE	00.0 REMOVED THE ROPS IN PREPARATION FOR AIR TRANSPORTABILITY STUDY EPR F8-799	00.0 STRAIGHTEN OUT BENT BRACKET ON THE FRAME ASSEMBLY COUPLER. EPR F9-801	00.1 TIGHTENED TEE TUBE FITTING ON STEERING SYSTEM ACCUMULATOR. EPR FB-802
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			DESCRIPTION	88.8 TIGHTEN LOOSE BOLT IN ENGINE SIDE COVER EPR F8-883	00.0 REINSTALLED ROPS, CANVAS, AND CAS FRAME EPR F9-860	12.3 DIAGNOSED TRANSMISSION SHIFTING PROBLEMS REPLACED 2ND GEAR SOLENDID EPR FB-85			00.0 ADDED 2 QTS OF ENGINE OIL	00.1 ADDED 2 GALLONS TRANSMISSION FLUID	DO.O REAR BEARING ASSEMBLY IN TRANSMISSION DISIMTEGRATED CAUSING A BREAK IN THE REAR BEARING CAP. REMOVED TANNSMISSION, DISASSEMBLED, INSTALLED BEARING ASSY RE-ASSEMBLED + REINSTALL BACK IN THE	POWER SECTION EPR F8-905	REAR BEARING ASSEMBLY BALL, BEARING 15/32 IN. DIA. BEARING CAP, REAR	2.5 DETERMINATION OF CAUSE WHY NEW FUEL PUMP WOULDN'T ALLOW THE ENGINE TO IDLE. EPR F3-928	REMOVED FUEL PUMP, REINSTALLED_REBUILT_PUMP, AND RECALIBRATED. EPR F9-92815-1		10.2 DETERMINATION AS TO WHY RPM GAUGE WOULD INDICATE INTERMITENTLY, FOUND FAULT TO BE AT THE TACH GENERATOR. EPR FD-929
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	ND DRIVEN ET HOSE EPR	RMED REPLACED PARKING BRAKE PACS. EPR F8-962		VARIABLE DISPLACEMENT PUMP.		TIGHTEN FITTING TURBOCHARGER EPR F8-965 EM 01	CLEANED AND SERVICED BATTERIES AND TIERY PACK EPR F8-965	REPLACED WIPER HOTOR FILTER EPR F8-965 EH03		TIGHTEN FIFTING ROTARY HANIFOLD EPR -965	EPR F8-965 ITEMS	AND INSTALLED TIE CLAMP		TIGHTEN HOSE FITTING ON DOLLY WHEEL DRAULIC CYLINDER. EPR F8-565 ITEM 07
	ON GROU	BRAKE		E OISPL		TURBOCH	1CED 8A	3108 FI		ROTARY	EPR FB-	SNI ON		TING ON
8	0-RING	PARKING		VARIABL	PUMP.	ITTING	NO SERV	MIPER H	•	ITTING				VLINDER
DESCRIPTION	REPLACED O-RING ON GROUND DRIVEN EMERGENCY STEER PUMP OUTLET HOSE EPR F8-961	PACKING PREFORMED	940	REPLACED	VARIABLE DISPLACEMENT PUMP.	TIGHTEN F	CLEANED AND SERVICED BATTERY PACK EPR F8-965	REPLACED ITEMBS	FILTER, AIR, MIPER HOTOR	TIGHTEN F	TIGHTEN PACKING WHEEL GLOBE VALVE	EPR F3-965 ITEM86		TIGHTEN H
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work-		PARTS 58K-219 31/33/78 01	FARTS 1990761		-9				PARTS 5206381				PARIS SST2M-4	
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Mean	396	965	596	596	696	365	596	996	965		596	
DESCRIPTION	TIGHTEN SENDING UNIT IN TRANSMISSION EPR F8-965 ITEM 88	REROUTE STARTER ELECTRICAL CASLES EPR	TIGHTEN FITTING BOTTOM OF ACCUMLATOR EPR F8-965 ITEM #	CLEAN AND SERVICED AIR CLEANER EPR F8-965 ITEM #11	STRAIGHTEN FIRE EXTINGUISHER HOUNTING BRACKET EPR F9-965 ITEM12	JIGHTEN MIRING HARNESS CANNON PLUG AT ROTARY MANIFOLD EPR F8-965 ITEM813	TIGHTEN HYDRAULIC LINE HOSE CLAMPS UNDER FENDER AIR CLEANER SIDE EPR F9-965	TIGHTENED HYDRAULIC LINE FITTING COUPLER UNLOCK CYLINDER EPR FB-965	REPLACED TORQUE CONVERTER LOCK UP LIGHT EPR F8-965		REPLACED PANEL LAMP ON RIGHT HAND INSTRUMENT PANEL. EPR F8-965 ITEM 017	
K 111					Ī		-		Ī	HARNING LAMP		
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wa. & m	•	1956	=	1801	1030	1059	-41102		12
T H E DESCRIPTION	00.0 ROTATE RIGHT REAR DUMPER STEEL MMEEL ASSEMBLY AND TIRE TO LEFT SIDE POWER SECTION. PLACE LEFT SIDE ALUMINUM MHEEL ASSEMBLY AND TIRE TO RIGHT REAR DUMPER. EPR FB-3 STEP MISSING IN MANUAL FOR REPLACING TIRE AND WHEEL ASSEMBLY	NHEEL, RIM GROUND DOWN SLIGHTLY TO MAJE WITH WHEEL SAFETY RIM NOT SHOWN AS PART OF WHEEL ASSEMBLY IN IIN DEF 5201-20 AND P EPR F8-1056	88.8 REPLACED BROKEM QUICK RELEASE PIVOT PIN On Dumper Epr FB-14	PIN, QUICK RELEASE, ROADSIDE TAILGATE  10.5 1 00.0 REPLACED BROKEN RETAINING SPRING ON SHOE OF THE DUMPER PARKING BRAKE ASSENBLY EPR FB-1057	00.2 1 00.1 50 HOUR MAINTENANCE TO DUMPER SECTION	00.0 REPLACED BURNED OUT CURB STOE REAR CLEARANCE LAMP EPR F8-1050	BULB, CLEARANCE LAMP 00.2 1 00.0 REPLACED BROKEM QUICK RELEASE PIVOT PIN 20114-1	GP=000001801 MO=01 LIFE=00035 PIN, QUICK RELEASE, ROADSIDE TAILGATE.	00.2 1. LUBRICATE SHAFT ON DUMPER LATCH CONTROL VALVE 2. INCLUDE THIS PROCEDURE IN LUBE 020ER EVERY 10 HOURS 5. EPR F8-21
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	91.6 2	91.2 2	00.2 1	PIN. 0	RETAIN 00.2 1		BULB, 0		1 1 1
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TEST 11EM C G CO S R OL F P NY	=	=	5	0=0		60	0=0	0=0	9
2	0 Z Z		Y 1801	GP=000061801 NO=	1081201 NO=C	N 0609	GP=000980699 HO=0	ž	N 4316
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HAINTEMANCE TASK LOG NO TO S OHR A A H DON C T F OUD T E T HRS N	01/00/77 1 024.9 001	03/06/77 1 032.0 002	09/08/77 1 056.0 003	PARTS CL-16-8LP-C-2.30	PARTS 949444 11/08/77 1 076.9 005.0	11/06/77 2 063.4 006	PARTS M315570-1251 13/08/77 1 092.0 007.0	PARTS CL-15-9LP-C-2.30	15/08/77 1 103.4 008.0
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					DESCRIPTION		00.1 50 HOUR MAINTENANCE TO DUMPER SECTION CHECKED POWER CLUSTER RESERVOIR FLUID LEVEL, CHECK MIDMOUNT BEARINGS - ADDED 135 ML. BRAKE FLUID. EPR F8-24	00.1 REPLACED LIGHT BULB IN CURBSIDE REAR CLEARANCE LAMP OF DUMPER REPLACED LIGHT BULB IN ROADSIDE REAR TAILIGHT LAMP OF DUMPER EPR FB-1059	COMPOSITE REAR LAMP GLEARANGE LAMP OF DUMPER	00.1 REPLACED BULB IN ROADSIDE TAIL-LIGHT LAMP OF DUMPER SECTION. EPR F8-1115	GP=808080609 NO=81 LIFE=888.0 BULB, TAILLIGHT, ROADSIDE	00.0 1. PERFORMED 50 HOUR MAINTENANCE ON DUMPER UNIT A. INSPECT/SERVICE HASTER CYLLMDER RESERVOIR - LEVELS OIL - 1.1 HOUR) 8. INSPECT/SERVICE MOMMOUNT	BEARINGS-ADDED 65 MLS DIL - (.1 MOUR) EPR F3-1031	00.0 REPLACED CURBSIDE TAIL-LIGHT LENS EPR F8-20(S-1)	DOOR ASSEMBLY, COMPOSITE, REAR LIGHT	00.0 REPLACED CURBSIDE REAR TAIL-LIGHT LENS EPR F9-1060129-1)	CP=808080809 NO=81 LIFE=817.2 DOOR ASSEMBLY, COMPOSITE, REAR LIGHT	88.8 REMOVED AND CLEANED OUT FILLER CAP (POWER CLUSTER) REINSTALLED EPR F8-1055	00.0 REPLACED BROKEN QUICK RELEASE PIVOT PIN ON DUMPER TAILGATE EPR F8-41(14-2)	PIN, QUICK RELEASE, CURBSIDE
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	2 5	a HO	N OO	900	ES			99	PARTS #515570-623 #515570-1251		PARTS HS15570-623	6,		51	PAPTS 116.39535	99	335	116	173	8
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waan	;	1032	65	1034	24(5-1)			1068	5	84(14-3)	
	BULB	8.		1 03		1	_	THEY	BEARINGS THE EMBLY EPR	ACT ING AS	
	ĕ		1 REPLACED ENTIRE REAR TAIL-LIGHT ASSEMBLY, TAILLIGHT BROKEN DURING TEST DEP 5208-34 + P (FIG 1, 08), EPR FB-59	IL, STOP, MKR.	: LUBRICATED EPR F8-1834 00.5 REPLACED HIDHOUNT BEARING ON DUMPER	1	BEARING ASSY, MID-MT (DEP 5 208-34 + P FIG. 4. 1		IIO POUNT BEARI IIO POUNT THE IN AEASSEMBLY BEARING. EPR	ACT INC	
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		I S E	13.	1 2	5	4	4	50	HIGPOUNT HIGPOUNT THAT OF IN BEASING	RELEASE PIN 2. PIN CAME VEHICLE EPR	
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	5	PRI PER	8 8 9 5 1 5 1 5 1 5 1 5 1 5 1 5 1 5 1 5 1 5	Ç	= 8	Ž	88	AI	O H W S S	4. PE	
	00.0 REPLACED CURBSIDE REAR TAIL-LIGHT EPR FB-44 Candesent	O PULLED 50 HOUR MAINTENANCE A. CHECH MASTER CYLINDER RESERVOIR - LEVEL OK CHECKED MIDMOUNT BEARING FLUID LEVEL ADDED 65 ML. EPR F8-1032	ASSEMBLY, TAILLIGHT BROKEN DURING DEP 5208-34 + P (FIG 1, 00). EPR FB-59	NA NA	: LUBRICATED EPR F8-1834 S REPLACED HIDMOUNT BEAR	SECTION BEAKING MASCLUSING OIL EPR F8-24(5-1)	1	SERVICE BRAKES ON DUMPER. TOO NUCH AIR. EPR F8-1058	A A DUSTED ACTUATOR FOR MIDPOUNT IT MAS NOT ENGAGING THE MIDPOUNT BEARING OF THE DUMPER TO THAT OF POWER UNIT, DUE TO ERROR IN REASS FOR SEAL OF A DESCRIPTION OF THE PROPERTY	00.0 1. REPLACED QUICK RELEASE PIN TALL GATE PLYOT PIN 2. PIN CAHE DURING OPERATION OF VEHICLE EPR	
	592	N N N	23.	1	PR	2	· v	N. E	A S G S S	9 - 0	
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DESCRIPTION	7.5	36.96	381	3 =	R IC	Š	-0	SSI	20 28	25.25.25.25.25.25.25.25.25.25.25.25.25.2	36.
965	O REPLACE EPR F8-44 DESENT	STE	ASSEN DEP 5	101	בנים	56-24(S-1)	Ξ	AO	A A A JUSTED  IT WAS NOT BEARING OF POWER UNIT	1 1. REPLACE TAIL GATE POURING OPER	9
	- m 0	-104	-405		. v.	7	SY,	NERE USING	BEARING OF POMER UNIT		8
P 1 4 3	C C A C Y N 0609 00.0 00.1 00.1 1 00.0 REPL EPR FB GP=00000609 NO=01 LIFE=041.6 BULB, INCANDESENT	•		GP=000000609 NO=01 LIFE=073.3 LIGHT-TAIL, STOP, MKR.		1	×	•	-		GP=000081801 NO=01 LIFE=027.3 PIN, QUICK RELEASE.
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08/03/77 1 302.9 020.	12.9 02		2 2 5	0	0	-	z	A 7 A 0000				00.5	8	00.2 1	-	3	1 50 HOUR MAINTENANCE CHECK MASTER CYLINDER RESERVOIR. BEARING LEVEL-ADDED 90 MLS TIGHTENED DRAIN PLUG ON MDM EPR FJ-1035	CYL CYL 16 LE	HAIN INUE VEL- ORAI	SER RI	ANCE ESERV ED 90	CHECKE OIR.	00.1 50 HOUR MAINTENANCE CHECKED LEVEL IN MASTER CYLINDER RESERVOIR. CHECKED HDNI BEARING LEVEL-AODED 90 MLS OF OIL. TIGHTENED DRAIN PLUG ON HOHT 3EARING. EPR F3-1035	HDMT HDMT	1035	
13/09/77 1 343.8 021.	.3.8 02		S	0		-	Z	Z .		00.00		0.2	•	2.0	-		00.0 50 HOUR HAINTENANCE 39ML 10 REAR HIDHOUNT BEARING. 9REAT1ERS FROM 250 HOUR HA EPR FG-23(S-1)	OUR R HI ERS	HAIN DHOU FROH S-11	INTEN DUNT DH 25	BEARI B HOU		D 50 HOUR MAINTENANCE 39ML OF FLUID TO REAR MIDMOUNT BEARING. INSTALLED BREATHERS FROM 250 HOUR MAINTENANCE. EPR F8-23(S-1)	OF FLUID ADDED INSTALLED NTENANCE.	73(5-1)	÷ ·
PARTS 569022-03 569022-03 AC43987	0 0 0 0		9	9 8 8	GP=000081000 000080900 000081204	819	900		20.0	NO=01 LIFF= 01 01	2		46	L E E	A SS	VENT ASST. VENT ASST. FILTER ELEM	VENT ASSY, BREATHER, AXLE VENT ASSY, BREATHER, MIDHOUNT FILTER ELEMENT, FL, POWER CLUSTER	ER.	A XLE HIDH ONER	SR CL	USTER					
14/09/17 1 357.1 021.	57 .1 02	-	3	3	3	7	2	090	6	9		1.0	8	-	-	8	D REPLACED EPR F9-133	ACE 0	BUL	1.8 1	N ROA	DSIDE	U C C A C Y N 0609 00.0 00.1 00.1 1 00.0 REPLACEO BULB IN ROADSIDE TAIL LIGHT	ТЕНТ	133	
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24/09/77 1 452.5 022.	52.5 02		SCCA	0	=	> E	2	0000		0.00		2.00	00	1 2.00	-	:	1 PERFO	ORHE 7	0 20	50 HO	UR MA	INTEN	00.1 PERFORMED 50 HOUR HAINTENANCE EPR	~	1037	
24/09/77 1 452.5 022.0A	20 5.29	2.0A L	3 n	S	4	-	>	H Y Y 1801		0.00		00.1		1 1.00	-	:	0 REPLACED BROKE EPR F9-196(14-4)	ACE0	614-	10KEN	TAIL	CATE	00.0 REPLACED BROKEN TAIL GATE PIVOT PIN. EPR F9-196(14-4)	PIN.	196(14-	
PARTS CL-16-8LF-L-2.3	3-1-1-E	.30	65	= 00	000	818	801	NO	=01	5	FE = 1	55.	PI	ż	0	×	GP=000081801 NO=01 LIFE=155.9 PIN, QUICK RELEASE	w								
27/09/77 1 479.7 023.	20 1.61		UFFAC	4	0	-	>	Y Y 1801		00.00		03.1	90	06.2	~		00.0 REPLACED TAIL GATE HINGE FIN; STRAIGHTENED BENT PIVOT HINGE REINSTALLED TAILGATE, EPR F8-20	ACE D HTEN	EO B	BENT BENT	ATE H PIVO ATE.	O REPLACED TAIL GATE HINGE FIN; STRAIGHTENED BENT PIVOT HINGE AND REINSTALLED TAILGATE, EPR F8-2001	O REPLACED TAIL GATE HINGE FIN; Straightened bent pivot Hinge and Reinstalled tailgate, EPR FB-20014-5)	16-9	200(114-5	-
CRITICALITY FACTOR= 0.	CTOR=	0.50	-	-	1	-	-	-											i					-	-	
PARTS CL-16-BLF-L-2.3	2-1-118	.30	ď	= 00	000	81	801	9	= 01	Ξ	FE=0	20.5	Id S	ż	5	ž	GP=000061801 NO=01 LIFE=020.5 PIN, QUICK RELEASE	w								
28/09/77 1 496.4 024.0	20 7.96		ο ο ο	۷ ک		>	Z	H Y N 1801		0.00		100		00.1	-	:	1 00.0 REPLACE TAIL GATE PIVOT PIN EPR FB-212(14-6)	ACE (114-	TAIL	11 GA	16 91	V01 P.	IN EPR		212 (11 -6	:
PARTS CL-16-BLF-L-2.3	2-1-170	. 30	20	0=	000	8 16	8 0 1	NO	= 01	5	0=0	11.	PI S	ż	5	CK	GP=000081801 NO=01 LIFF=011.5 PIN, DUICK RELEASE									

mean	215(14-7)	1038		190		1039	1991	152			1042	1001	
				S S				=		8	386		
				00.0 1. REPLACED BURNED OUT LIGHT BULBS EPR F8-190			PERFORMED_50 HR_MAINTENANCE PER_LUBE. ORDER LOS208-12. ADDED 21 ML. OF OE/HDO TO THE MIDMOUNT BEARING EPR F8-18%1	00.0 REPLACED LAMP IN CURB SIDE TAIL LIGHT EPR FB-254		LEFT + RIGHT REAR TIRES PRESSURES WERE LOW AT	PER LUBE		
	æ	NO 3		B GL		6	EPR C	=		10 X		EPR	
	00.0 REPLACEO TAILGATE PIVOT PIN EPR FB-215(14-7)	500 HOUR MAINTENANCE TON EPR F8-1038		Ħ		50 HR HAINTENANCE. EPR FB-1039	a F S	=	,	S S	50 HOUR MAINTENANCE -208-12. EPR F8-1042	MAINTENANCE EPR	
	1	A S		51			PERFORMED 50 HR_MAINTENANCE FOR CORER LOS 208-12, ADDED 21 HI DE/HDG TO THE MICHOUNT BEARING F8-1041	301		HE SH	-208-12. EPR F8-104	4	
	10/	RELEASE O PERFORMED 500 HOUR MAINT DUMPER SECTION EPR F8-1036		-		œ	BE OF	20		ES	IN S	1	
	É	2.	E	9		<b>W</b>	AP	UR		+ 55	EPR	AIN	
	3	20 %	LS O	NE		CE	10 H	Z		RES	2.5		252.6 VENT ASSY, BREATHER, AXLE
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ž	IA.	10N	TOH	60	LB DSI BSI	NTE	E 25	LAH		ROTH	-20	52	AXLE
DESCRIPTION	0 REPLACED T FB-215(14-7)	00.0 PERFORMED DUMPER SECTI	BREATHER, AXLE BREATHER, MION IENT, FL, POWER	LAG	ROADSIDE CURBSIDE	HAI	MED 5-	24			_	00.0 PERFORMED 250 HR FB-1044	٧.
R	2 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	208	F. F. F.	S EP	===	ď	80-4	O REPLACED EPR F8-254	_	00.0 INFLATED TO 55 PSI. 50 PSI.	PERFORME ORDER LOS-	. O.	4ER
SES	21.	DUMPER	AT.	0 1. R FB-190	199	0	PERFO ORDER L OE/HDO FB-1041	E FI	EN	SS P	ER	D PERFO	A
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SE ALT	8 3	¥ :	E	8	VIC			8	ANG	:		8	VENT ASSY, BREATHER,
IWZ		2 00	ASSY, ASSY, ER ELEN		SER	-	-	-	INC	-	-	~	ASS
			VENT ASSY, BREATHER, AXLE VENT ASSY, BREATHER, MIDHOUNT FILTER ELEMENT, FL, POMER CLUSTER	00.3 1	ROADSIDE STOP LIGHT REAR SERVICE LIGHT REAR SERVICE LIGHT	0.3	0.3	1.00	LAHP INCANDESCENT	9.00	1.0	03.5	VENT ASSY, BREATHER,
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	mean	1063	25515-21.	145 (5-2)	150	099	299		993	555		956	
	DESCRIPTION	PERFORMED 50 HR MAINTENANCE PER LUBE ORDER LOS- 203-12. EPR FB-1043	3 00.0 ENLARGED DUMPER BODY AND TAILGATE HINGE PIN HOLES. INSTALLED (2) 1.125 IN DIA ,4.5IN LONG CAPSCREMS & NUTS IN PLACE OF DAMAGED QUICK RELEASE PINS EPR FB-255 (5-2).	ADJUSTED SERVICE BRAKES ORATHED BRAKE SYSTEM, REFILLED WITH SILICCNE FLUID READJUSTED BRAKES. EPR FB-345(S-2)	00.0 50 HR LUB L05208-12 EPR F8-350	DO.O RE THREAD BROKEN THREADED END OF THE RAISE/LONER CONTROL DO EPR F8-660	00.0 REPLACED BURNED OUT LAMP IN ROAD SIDE CLEARANCE LIGHT EPR F8-662	LAMP, INCANDESCENT	00.0 PERFORMED 50 HR MAINTENANCE 2 HEN X 50 MINUTES TO UNCOUPLE 2 MEN X 15 MINUTES TO RECOUPLE 2 MEN X 30 MINUTES MAINTENANCE EPR FB-663	07.0 3 00.0 PERFORMED 1000 HOUR MAINTENANCE EPR FB-555	VENT ASSY, BREATHER, AKLE Vent assy, breather, midhount Filter element, Fl, pomer cluster	00.0 REPLACED PIPE PLUG IN MIDHOUNT BEARING HOUSING EPR FG-556	
	5 T T 3		.00				:	MCAN			VENT ASSY, VENT ASSY, FILTER ELEM	:	341
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OU NU NAM CR R GE KS DESCRIPTION	00.0 00.0 0 00.0 UNCOUPLED FROM POWER SECTION T-915	00.2 00.2 1 00.1 REMOVED AND STRAIGHTENED COTTER PIN (SAFETY PIN) REINSTALLED COTTER PIN ON PINTLE HOOK. (TECHNICAL INSPECTION) EPR F8-622	5 00.5 1 00.1 REINSTALLED AIR MANIFOLD HANDLE + PIVOT PIN EPR F8-622	00.5 1 00.1 REPAIRED PARKING BRAKE HANDLE ADJUSTER (TECHNICAL INSPECTION) EPR FB-622	REMOYED REAR COMPOSITE LIGHT INSTALLED NEW COMPOSITE LIGHT REPAIRED NEW COMPOSITE LIGHT REPAIRED ROCK GUARD 4. SPOT PAINTED DANAGED AREAS. EPR FB-869	.6 3 00.0 PERFORMED 50 HOUR MAINTENANCE EPR F9-633	1 00.0 WELD HAND HOLDS ON REAR OF DUMPER BODY EPR F8-880	1 REPLACED PLUG, QUICK DISC, INCIDENT I, EPR F8-930	PLUG, QUICK DISC	1 1 REPLACED CASLE AND RING ON OROP STAND, INCIDENT 2, EPR F8-930	CABLE, OROP STAND	0.1 1 ADDED 1/8 PT. OIL TO MIDMOUNT BEARING. (MAINTENANCE TIME DOES NOT INCLUDE UNCOUPLING AND COUPLING TIMESIEPR
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		4	~	s		930	930		930	930	-	255(5-3)	348 (5-1)	(1-5)699
					DESCRIPTION	REMOUNTED TIE-DOWN SHAKLE CHAIN. EPR 930 EPR F8-930	REPLACED BREATHER AT MIDMOUNT, INCIDENT 95. EPR F8-930	22 VENT ASSY, BREATHER, MIDMOUNT	TIGHTENED AIR LINE BRACKET BOLTS EPR 9	INSTALLED NEW GREASE FITTING IN INTERHEDIATE PROP SHAFT INCIDENT 7, EPR F8-930	RICATION	ORILLED AND INSTALLED COTTER PIN TAILGATE 30LTS. THIS ACTION IS CONSIDERED A MODIFICATION TO THE EQUIPMENT EPR FB-255(S-3)	REROUTED ELECTRICAL MIRE TO BACKUP 3	TIGHTENED DPOP LEG BOLTS EPR FB-869(S-1)
		E 11		39 Y	A CONTRACTOR OF THE PARTY OF TH	1 1 1	0.1 1	FINT ASSY.	0.1 1	1.1.1	FITTING LUBRICATION	3.1	0.2 1	0.1 1
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03/05/79 MAINTENANCE TASK LOG	S OHR	NOO H	F 000	T MRS		31/03/78 010	31/33/78 01086 045.00 U C C A	PARTS 569022-03	31/03/78 010	31/03/78 010	PARTS 10H-25	31/03/78 010	31/03/78 010	31/03/78 010
03/05 MAINT	0	4	-	w		31/0	31/0	PART	31/0	31/0	PART	31.70	31/0	31/0

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10		**	GE DESCRIPTION		00.0 ASSEMBLE AND INSTALL CAB HAUL FRAME	08.8 INSTALL WINDSHIELD & WIPER ASSENBLY	00.0 INSTALL "ROPS" ON POWER SECTION	00.0 INSTALL TWO (2) REAR VIEW SIDE HIRRORS	00.0 ADJUST SERVICE BRAKE ON FRONT RIGHT HHEEL EPR FO-30	00.0 REPLACED DEFECTIVE PARKING BRAKE CABLE - EPR FB-47	PARKING BRAKE CABLE	88.6 CHECKED TIRE PRESSURE AND 48 D TO ADO AIR TO BAING PRESSURE UP TO 55 PROJ. ALL TIRES WERE LOW	88.9 ADDED THO OTS ENGINE OIL.	99.0 INSTALLED CAPACITOR ON HOUR METER TO PREVENT SPIKES WHICH COULD CAUSE THE METER TO SIVE IMACCUPATE HOUR READINGS. NOT SHOWN IN IT BECAUSE THIS ITEM ADDED TO IMPROVE ACCUBACT OF HOUR METER DURING TESTING EPR F8-34	GEAR) DIASSMONFAILED TO SHIFT INTO 1ST GEAR) DIASSMOSED AN OPEN CICUITY WITHEN 1ST SOLENDID ON TRANSMISSION. REPLACED SOLENDID AND OPERATION OF 1ST, 2ND, 350, 1, 174 GEARS CHECKED ON DURING TEST	DEILE. 1578 16-4911/-15	SOLEMDID/ELECT. CONTROL VALVE ON TORQUE CO	PERFORMED 50 HOUR MAINTENANCE CHECK AS REQUISED 31 LUGE ORDER, 1. CHECKED FLUID LEVEL IN MASTER CHINGES. LEVEL OK 2. CHECKED LUID LEVEL IN MIDMOUNT BEARING. LEVEL OK 3. CHECKED GREAS FITTINGS ON POWER SECTION, ALL APPEARED
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H 01  E 11  N AH  GE	00.2 1 00.1 ADDED 2 QUARTS OF ANTIFREEZE TO RADIATOR SURGE TANK. 00.5 1.00.0 RETIGHTENED FITTING ON HOSE ASSEMBLY BETWEEN SURGE TANK AND ENGINE WATER PUMP ADDED 10 GAL COOLANT EPR F8-67	00.1 1 00.0 ADDED 3 QTS OF COOLANT TO RADIATOR 00.1 1 00.0 ADDED 1 QUART OF ENGINE OIL 7.5 2 250 HOUR SCHEDULED MAINTENANCE EPR FB-1090	FILTER ELEMENT, OIL, FULL FLOM FILTER ELEMENT, OIL, BYPASS CARTRIDGE, FUEL FILTER FILTER ELEMENT, OIL, TRANSHISSION FILTER ELEMENT, HATER, CORROSION RESIST FILTER ELEMENT, HL, POWER CLUSTER VENT ASSY, BREATHER, ANTE VENT ASSY, BREATHER, TRANSHISSION	0 0 I C Y N 1201 00.0 05.5 05.5 1 00.5 REPLACED PARKING BRAKE CAELE THIS PROCEDURE NOT IN MAC EPR FB-101 GP-000011201 NO=01 LIFL=092.4 PARKING BRAKE CA9LE C C A C N N 0000 00.0 00.1 00.1 1 00.0 ADDED 2 QTS OF COOLANT TO RADIATOR,	00.1 1 00.0 REINSTALLED WARNING DECAL CAME OFF DURING WASH DOWN EPR F8-79	00.4 1 00.1 TIGHTENED BOLTS ON SCRAPER DRIVE SHAFT GUARD. EPR FB-109 0.2 1 TIGHTENED BOLTS RETAINING SURGE TANK ON COOLANT SYSTEM. EPR FB-1062
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U3/05/79  HAINTENANCE TASK LOG TO S OHR A TO A H DON C A TO T T F OUD T S E T HRS N K	01/09/77 1 218.5 7.1 02/09/77 1 226.0 008.0 CRITICALITY FACTOR= 1.00	03/09/77 1 236.6 009.0 03/09/77 2 248.2 010.0	PARIS MS-35602-3 9311 5676 16-511 299060 AC43867 569022-03 569020-02	06/03/77 1 248.7 010.1 PARTS 2546146 08/09/77 1 257.1 011.0	08/39/77 1 261.3 012.0	10/09/77 1 282.0 013.0

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DE SCRIPTION	100.0 ADDED 1 QUART OF COOLANT TO BRING SURGE TANK UP TO PROPER LEVEL. 12.0 WORKED ON PROBLEM ASSOCIATED WITH ENGINE REMAINING AT HIGH IOLE RPM. EPR FB-112	00.0 SODEO ONE (1) QUART OF ENGINE OIL 00.0 SO HOUR MAÎNTENANCE PUR SECT. MIDMOUNT 8 5 SQUIRT OF OIL WK SECT. MIDMOUNT 8 10 POMER SECTION RESERVOIR MK SECT.	00.0 RE-JEMENT DECAL MARNING NUT MUST BE SECURE PRIOR TO OPERATION. (MAC DOES NOT LIST A GROUP NUMBER FOR DECALS). EPR F8-144	00.2 EPR F9-145 INSTALL NEW STEERING VALVE OPERATOR HAD TO STOP DUE TO DIL OP HIS SHOE AND ON THE BRAKE + ACCELERATOR PEDALS	VALVE, STEERING	00.0 ADDED 1 GALLON OF HYDRAULIC DIL TO Replace loss, when new steering pump Mas installed	02.6 2 00.0 INSTALL SECOND STEERING VALVE EPR FB-146(145-1)	EERING	00.1 INSTALL KIT ON STEERING VALVE EPR F8-145(S-1)	œ.
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03/05/79 MAINTENANCE TASK LOG S ONR A H D DON C T F CUD T E T MPS N	10/09/77 1 262.0 013.08 10/09/77 1 262.0 013.0C CRITICALITY FACTOR= 1.00	13/09/77 1 295-1 015-0	16/03/77 2 341.8 017	15/03/17 2 342.5 018.0 CRITICALITY FACTOR= 1.00	PARTS 1-6840011	16/09/77 2 342.5 10	16070	PAPTS 1-6840011	21/09/77 2 353.0 020.0	PARTS 996330
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10	AH H	DESCRIPTION	00.0 ROADSIDE HEADLIGHT REPLACED. EPR F8-180	_	00.0 REPAINED CURBSIDE DOLLY WHEFL BREAK WITH TEMPORARY NUT + BOLT FIX. EPR FB-102	TIGHTENEO SIDE VIEW MIRRORS. EPR F8-1063	00.0 ADJUST + TIGHTEN ALTERNATOR BELTS THE BELTS WERE LOOSE EPR FB-1064	00.0 REPLACED SERVICE HEADLIGHT LEFT SIDE EPR F8-165		00.0 RETIGHTEN THE DOLLY WHEEL RETAINING NJT + SECURED WITH COTTER PIN. EPR F8-166	00.0 FAN BELTS WERE ADJUSTED BECAUSE THEY WERE TOO LOOSE (MOISE COULD BE HEARD OVER THE NOISE OF THE ENGINE) EPR FB-103	00.0 ADDED 2 1/2 QUARTS OF OIL TO THE HYDRAULIC TANK	00.0 ADDED 1 GALLON HYDRAULIC OIL TO TANK.	00.0 INSTALL DOLLY WHEEL SHUT OFF VALVE. EPR F8-192	00.0 REPLACED LEFT REAR TIRE, A LARGE SECTION OF TREAD WAS TEARING LOOSE ON OLD TIRE INSTALLED NEW PREFGRMED PACKING EPR FB-167	TIRE, PNEUMATIC
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		S .	00.3	GP=000010609 NO=01 LIFE=UNK	2.00	2.0	01.0	1.00	GP=000010609 NO=01 LIFE=008.6	2.00	01.0	2.00	2.00	5.00	03.0	
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wa. a. u	4	:	4	12			226			352		353	106
01 44 66 0650R1P110W	SO HOUR MAINTENANCE TO POWER UNIT  REORMEO A. DISCURNECT P.S. LOADER B-INSPECTEU HA THE CYLINCER-LEVEL OK  HR C-145/EGIEO 100/00/0 BEARINGS .?  HR Q-1 Fb 45	HERE SOLTS & NUTS HERE OSE EPR.	10.0 F. MOVE. 6 9-204	DO.O REM. ALVE. GLEAM .	00.0 + 075 OF OIL ADDED TO TO	88.8 ADDED I GALLON TRANSMISSION DIS	90.0 LOADER CAPSIZED WHILE PIT DOZING AND HAG TO BE UPRIGHTED AND CHECKED OVER. EPR F9-226	PERFORMED SO HOUR SERVICE. EPR F8-1847	DIFFICULTY UNCOUPLING. CLARK REP CHECKED PRESSURES-OK. EPR FE-1047	DO.O TIGHTENED BOLTS ON FUEL TANK, SURGE TANK AND MATER HOSE CLAMP. EPR F9-352	00.0 ADDED 2 QUARTS OF ENGINE GIL	88.8 ADJUSTED ALTERNATOR BELT - EPR F8-353	U O O A M Y Y 1203 GG.G 60.8 50.8 1 00.0 ADJUST SERVICE BRAKES EPR F8-1069
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03/05/79  MAINTENANCE TASK 0 S OHR A H DON 1 F F OUD E T MRS	26/09/77 2 402.4	4.504 2 777661.05	26/03/77 2 407.3	28/03/77 2 429.9	6.624 5 77760185	28/09/77 2 433.0	29/09/77 2 450.3	30/09/77 1 450.3	30/03/77 1 450.3	03/10/77 2 454.8	7.954 2 7770176	04/13/77 1 458.7 054.1 CATTICALITY FACTOR= 1.00	05/10/77 2 467.4 CHILICALITY FACTOR
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MADALA	~	2	2	2	2	2	~	2	3	0	0	OY	9 3

TEST , FAMEGEL TEST ITEM ,937 T S E E T Q A C G CO CH HH H A / C C H A H S R OL LO AO E					O THE MUT + MASHER (ON THE CIL FILLER CAP) FELL THROUGH INTO THE CYLINDER	TO BE REMOVED TO GET THE NUT + MASHER. THE CYLINDER HEAD COVER WAS	RE-INSTALLED. THE OIL FILLER CAP WAS THEN RE-ASSEMBLED. THE THREADED END WAS DISTORTED SO THE NUT COULD NOT COME OFF AGAIN EPR FB-233	ED MAINTENANCE EPR		-	STON	ION RESIST	STER		NOT S			O INSTALLED CANVAS CAB ASSEMBLY. (TH DEPS201-20+P INADEQUATE IT STATES THE PERTINENT CANVAS CAB ILLUSTRATIONS FIG 2-17C, PAGE 2-90C + FIG. 132, PAGE C-172 SHALL BE SUPPLIED LATER.)		E LINKAGE BALL JOINT	
TEST , FAMEGEL TEST ITEM ,937 T S E E T Q A C G CO CH HH H A / C C H A H S R OL LO AO E		- 1	AAA	DESCRIPTION	CAP) FELL THROUGH INTO THE CYLINGER	TO BE REMOVED TO GET THE NUT	RE-INSTALLED. THE DIL FILLER CAP WAS THEN RE-ASSEMBLED. THE THREADED END DISTORTED SO THE NUT COULD NOT COME AGAIN EPR FB-233	00.0 500 HOUR SCHEDULED MAINTENANCE EPR	FILTER ELEMENT, OIL, FULL FLOW		CARTRIDGE, FUEL FILTER FILTED FLEMENT, OTH, TPANSMISSION				VENT ASST, BREATHER, HUMI		FILTER, AIR COUTSIDE)	00.0 INSTALLED CANVAS CAB ASSEMBLY.  OEPS201-20+P INADEQUATE - IM ST THE PERTIMENT CANVAS CAB ILLUSTRATE FIG 2-17C, PAGE 2-90C + FIG. 132, C-172 SHALL BE SUPPLIED LATER.)	GP=000012201 NO=01 LIFE=00000 CAB ENCLOSURE - SOFT	DO.O REPLACED THROTFLE LINKAGE	K.H. EFR 18-250
TEST FAHECEI TEST ITEH 937 T S E E T Q A C G CO CH A / C C M A M S R OL LO				5	-	1		1	TER E	TER E	TRIDG	TER E	TER E	T ASS	A 55	TER.	TER,		ENCL	2	
TEST FAHECEL TEST ITEM 993 T S E E T Q A C G CO A / C C H A H S R OL	•		2	ĸ	91.8			09.6 2									FIL	99.4 2	D CAB	00	
TEST , FAHECE1 TEST ITEH , 93 T S E E T Q A C G CO A / C C H A H S R OL	, c	2 :	3 5	SS	91.9			9.40	LIFE=251.8	251.8	251.8	251.8	251.8	251.8	251.8	CNK	NA C	00.5	0000	05.0	
TEST FAHECE1 TSEETQA ACCHAH					0.00			0.00		-								0.00	LIFE	0.00	
TEST FAMECEL					Y 0106				NO=02	20	92	010	0.1	0	0	01	01	и 2201	NO=01	0312	
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03/05/79 MAINTENANCE 0 S					3		=		PARTS	-					,			*	PARTS 2546395	3	CRITICALITY FACTOR: 1.00

maan		356	357		35.8		350		361	362
DESCRIPTION	00.0 ADDED 2 GALLON OF HYDRAULIC OIL	REGULATOR VALVE UTILIZING AIR PRESSURE GAGE IN CAB. AIR PRESSURE GAGE IN CAB. AIR PRESSURE ACCORDING TO THE GAUGE, EPR F8-356	ACCELERATOR PEDAL, ACCELERATOR BECAME STUCK IN HIGH THROTTLE DURING PIT EXCAVATION OPERATION, EPR F8-357	00.0 ADDED 4 QUARTS OF HYDRAULIC OIL	00.0 REINSTALLED ROD END SUPPORT, 71TEM 22, FIG. 136, PB330, DEP5201-348PP ON THE TRANSMISSION DISCONNECT LEVER MITH A NEW HEXAGON NUT, EPR FB-358	NUT, PLAIN, HEXAGON, PHOS CTG, 1/2-20 UNF	00.0 PERFORMED 50 HR HAINTENANCE PER LUBE ORDER LOS-3040-201-12 MASTER CYLINDER MAS FOUND ORY. REFILLED HASTER CYLINDER MITH 1/2PT OF BRAKE FLUID. BOTH UNCOUPLING AND COUPLING OPERATION REQUIRED 20 HINUTES FOR 2 MEN. EPR	I ADDED 4 FL. 02 OF BRAKE FLUID TO MASTER CYLINGER.	01.4 ADJUSTED ACCELERATOR AIR WALVE, TIGHTENED NUT ON THROITLE LINKAGE, BROUGHT RPHUP TO SPEC. (2500) EPR FB-361	00.0 CA9 DOOR WAS REMOVED + PLACED IN
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MAINTENANCE D S S D S S A A A A A A A A A A A A A A	13/10/77 2 522.6	15/10/77 1 536.9 039.1 CRITICALITY FACTOR= 1.00	15/10/77 1 540.7	15/10/77 2 547.1	17/10/77 1 553.3	PARTS 80-8H	19/10/77 1 560.1	19/10/77 1 569.0	19/10/77 1 5/0.3 044.0	19/10/77 2 572.2
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		œ 1	^	364	38			1050	1050		369.	384		353		37.1	37.5	SUPP
		~ "	DESCRIPTION	NED SURGE TANK MOUNTING BOLTS.	ARE NOT ALL ED TO SECONDARY FUEL FILTERS-ONE SLIGHTLY CLOGGED CHECKED PRIMARY FUEL FILTERS-ONE SLIGHTLY CLOGGED CHECKED PRIMARY FUEL FILTER-OK CHECKED FHROTTLE LINKAGE WELDED SURGE TANK MOUNTING BRACKET ** REINSTALLED EPR FB-367	Control of Control Con	40ARY	50 HOUR SERVICE. EPR FB-1050 105	DIFFICULTY UNCOUPLING. EPR FB-1050 105	DO.O ADDED 42TS OF ENGINE OIL	00.4 REPAIRED WIRE FROM HOUR METER TO 369 PRESSURE SMITCH. EPR FB-369.	00.0 INSTALL NEW AIR COMPRESSOR EPR F9-384 384		02.0 1 00.0 REPLACED ALTERNATOR BELTS EPR F8-353 353	GP=000010601 MO=02 LIFE=458.7 BELT, ALTERNATORIREPLACE IN SETS)	00.2 FIGHTENED BOLTS HOLDING DRAIN VALVE TO 371	00.2 REPLACED AUTOHATIC DRAIN VALVE, ON AIR 373 Supply Tank Soldered Electrical Connections on New Valve. Epr F9-373	AUTOMATIC DRAIN VALVE (THERMO-EXPELLO) AIR RESERVOIR SUPPL
10	1	AM		00.0 RETIGHTE EPR F3-364	02.2 GLEAN AIR REP SLIGHTL FILTER- WELDED REINSTA		GP=000010309 NO=02 LIFE=090.7 FUEL FILTER, SECONOARY	50 HO	OIFFI	00.0 ADDED	DO.4 REPAI	00.0 INSTA	AIR COMPRESSOR	00.0 REPLA	TERNATORIR	DO.2 FIGHT	SUPPLY CONNECT	C DRAIN VA
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T H E DESCRIPTION	05.6 2 00.0 REPLACED DEFECTIVE TIRE (A 5" x 10" SECTION OF TREAD HAD BEEN TORN OFF OLD L.F. Tire EPR F8-365 Tire, pneumatic	00.0 PERFORMED 50HR MAINTENANCE PER LUBE ORDER LO5-3840-201-12. AODEO 1/2 PINT OF BRAKE FLUID TO THE MASTER CYLINDER. EPR FB-374	00.0 REPLACED LAMP IN CURBSIDE COMPOSITE REAR LIGHT EPR F8-37515-11	LARP, INCANDESCENT  10.6 1 00.2 TIGHTENED HOSE FITTINGS ON TRANSMISSION HOSE TO COOLER, FILTER AND RETURN LINE FROM COOLER TO TRANSMISSION INPUT. TIGHTENED ALL FITTINGS, PROELEM CORRECTED. EPR F8-378	DO.O REMOVED DIL PRESSURE SENDING UNIT AND APPLIED SEALING COMPOUND ON THREADS OF CONNECTION MITH SENDER BRACKET. REINSTALLED EPR FB-379	DO.O ADDED I GALLON DE-10 TO HYDRAULIC RESERVOIR	00.0 ADDED 1 GALLON OF ENGINE CIL 00.0 50 MAINTENANCE ADDED 10 ML OF LUBRICANT TO P.S. MIDHOUNT ADDED 4 0Z OF BRAKE FLUID TO MASTER CYLINDER RESERVOIR EPR	FB-380 00.0 SERVICE MEADLIGHT OUT REPLACED LAMP, SEAL BEAM EPR F8-381
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	and designed out to the tell of						00.3 ENGINE OIL PRESSURE GAGE INDICATING LOW OIL PRESSURE SENDER FAULTY, REPLACED SENDING UNIT, GAGE READING NORMAL, EPR F9-389	OIL LOCATED ON ENGINE MTD ON SWITCH	00.9 REPLACED DEFECTIVE RELAY IN REVERSE CIPCUIT FOR FA-198			HAINTENANCE 15 ML LUBRICANT IIDHOUNT 26 QTS OE-30 ENGINE EPR FB-391							and particular the same of the	00.1 ADDED 2 QT 0E-30 OIL TO ENGINE SUMP	RAULIC	00.1 TICHTFNED BOLTS ON THE TURBO CHARGER "V" BAND CLAMP. EPR F8-393	00.1 TIGHTENED CLAMP ON HOSE FROM THE INLET OF FILTER HEAD ON CORPOSION RESISTOR FILTER, TO SHUT OFF VALVE AT VALVE END
							3 ENGINE OIL PRESSURE GAGE INDICA OIL PRESSURE, ENGINE OIL PRESSURE SENDER FAULTY, REPLACED SENDING U GAGE READING HORMAL, EPR F9-389	OCATED ON	IVE RELAY			£ 15	**			JIL, TRANSMISSION	USTER		NOISS	0 OIL 10	GAL OE-18 TO HYDRAULIC	TIGHTENED BOLTS ON THE T	CORROSIO
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21/11/77 1 810.2 064	10.2	0.430		0	0				1 7 7 1410				00.3 1		8	00.2 ADJUSTEJ VARIAJLE DISPLACEMENT PUMP Pressure from 2350 to 2500 psi As Recomended by TM. EPR F8-669	699
22/11/77 1 819.6 064	9.61	064.1		o o	•				2				6	•	8	00.0 PERFORMED 50 HR MAINTENANCE PER LUBE ORDER LOS-3840-201-12 DURING PERFORMANCE OF THE 50 HR MAINTENANCE 17 HL OD HEAVY DUTY ENGINE OIL MAS ADDED TO THE MIDHOUNT BEARING. REPOYED DIRT AND HUD FROM COUPLER SECTION GRASED FITTINGS ACCORDING TO THE LUBE GROZE CHECKED MASTER CYLINDER AND FOUND IT HAD THE REQUIRED AMOUNT OF BRAKE FLUID EPR F8-670	0.73
78/11/77 2 829.6 065 FARTS 2546346	9.65	065.0		0 3	0 "	4 0		2 051	U O O A H T N 1507 GF=000011507 NO=0	10=0	0 0 A H Y N 1507 00.0 GF=000011507 NO=01 LIFE=	05.0		1 100		02.0 1 00.0 WELDED A NEW UPPER DOLLY CYLINDER SUPPORT BARCKET TO FRAME ASSY. EPR FB-102(S-1) SUPPORT, DOLLY CYLINDER, CURBSIDE	182(5-
28/11/77 2 629.6 965	29.6	965.0	40.	0 0 0	0	14		-	H Y N 2407		0.00	02.1	02.1 1	-	:	00.0 INSTALLED A NEW LUBRICATION FITTING, RUSHING, ANCHOR PIN AND LOCKPLATE IN TOP OF DOLLY CYLINDER STRAIGHTENED EYE ON TOP OF DOLLY CYLINDER, CURBSIDE, EPR FB-182(5-2)	182 (5-
PARTS MS15001-1 2503262 2503283 2549322				3		CP = 0 0 0 0 1 2 4 0 7 0 0 0 0 1 2 4 0 7 0 0 0 0 1 2 4 0 7 0 0 0 0 1 2 4 0 7	0000	240	200	2222	MO=01 LIFE=UNK 01 UNK 01 UNK	5 2 2 2 2 2 X X X X X X X X X X X X X X			TE SAI	LUBRICATION FITTING, TOP OF BOLLY CYLINDER LOCKPLATE PIN, STRAIGHT, ANCHOR BUSHING, SELF ALLIGN.	
28/11/77 2 829.6 965.09 U O O A M N N 0000	9.62	0.590	0	0	0	4			•		0	1.1	11.1			99.9 CLEANED ACID, FROM BATTERY BOX AND BATTERIES, SPILLED DURING ACCIDENT REPLACED JURBSIDE SERVICE HEADLIGHT RETAINER AND LAMP SHELL STRAIGHTED CURDSIDE SERVICE LIGHT BRACKET EPR FB-671 (S-1)	67105-1
PARTS 22670 5133				3		000010609	910	160	5 6	0:01	GP=000010609 NO=01 LIFE=UNK 000010609 01 UNK	2 KK	SHELL, LAMP	L'.		SHELL, LAMP RETAINER, LAMP	

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		DESCRIPTION	DO.O REPLACED 3 GAL. OF ENGINE DIL LOST During accident EPR F9-671(5-1)	00.0 INSTALLED MODIFIED TOP FUEL TAMK BARCKET SUPPLIED BY CLARK EQUIP. CJ. 10 X 2 1/2 X 3/4 ANGLE STEEL) EPR F8-672	00.1 REPLACED DAMAGED VALVE EPR F8-67815-11	VALVE, EMERGENCY RELAY QUICK RELEASE AIR BRAKE POWER CLUSTER	90.8 STRAIGHTENED AND REWELDED FUEL TANK MOUNTING BRACKETS (LOWER FRONT + OUTSIDE) STRAIGHTENED SIDE PANELS EPR FB-574	00.0 TIGHTENEO FITTING ON EMERGENCY PELAT Release valve epr F0-676	DO.D TICHTENED TOP MOUNTING BOLT ON FUEL TANK EPR F9-677	100.2 REMOVED PULL TYPE AIR CYLINDER, THROTYLE LOCK OUT SYTEM - REMOVED ICE AND CLEANED CYLINDER, REINSTALLED CYLINDER PART 2548982 EPR F8-599	00.1 REMOVED FUEL FILTER ASSEMBLY CLEAMED REINSTALLED FILTER ASSEMBLY EPR F8-600	00.0 ADDED 2 GALLONS OF HYDRAULIC DIL	00.1 REPLACED PIPE REDUCER AND REINSTALLED ORIGINAL ROAD SIDE RESERVOIR, AUTOMATIC DRAIN VALVE, EPR F8-525	PIPE REDUCER, ROADSIDE AIR RESERVOIR	00.1 VEHICLE MOULD NOT START, NO FUEL IN PRIMARY FILTER, PROBABLE CAUSE ICE IN THE FUEL SYSTEM, VEHICLE ALLOWED TO SET HALL AMAZEM! TEMPERINGE CLIMAGO AROVE
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73.04 U C C A M N M 1206 00.0 00.3 00.3 1 00.3 MORN ON MITHOUT BEING ACTUATED HAIRTENANY E PERSONNEL CHECKED THE SYSTEM PROBLEM CORRECTED MITHOUT ANY MAINTENANCE ACTION ICE IN AIR MONT MAINTENANCE OLIVE FOR CUITING OFF. EPR F8-510  75.0 S C C A M N M 0000 00.0 00.2 00.2 1 00.1 ICHTENEOUS EPR F8-510  76.0 U C C A M N M 0000 00.0 00.2 00.2 1 00.1 ICHTENEOUS EPR F8-510  77.0 S C C A M N M 0000 00.0 00.2 00.2 1 00.2 I 00.0 ADDEO E GALLONS ANTIFREEZE TO COOLANT MAEL LACTOR MONT MAINTENANCE DOLLY WHEEL LACTOR MONT MAINTENANCE DOLLY WHEEL LACTOR MONT MAINTENANCE ED TO LONG ECON MONT MAINTENANCE DOLLY CYLLNOR FROM THE MAINTENANCE TION AT MONT MAINTENANCE OFF FB-45.  79.0 U O O A C W M 2407 00.0 01.0 02.5 1 00.0 APPLACE CLARSTOC DOLLY CYLLNOR FROM FB-46.  6P=0000112407 NO=01 LIFF=UNK CYLINDER, ASSENBLY EPR F8-46.  6P=0000112403 NO=01 LIFF=UNK COUPLING, ITBE  6P=000012403 NO=01 LIFF=UNK COUPLENG, ITBE  6P=000012404 NO	-	HRS	z	¥		œ	n						a s	œ		ge .	DESCRIPTION	s,
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75.0 S C C A M N 0000 00.0 00.1 00.2 1 00.1 IIGHTENED WIRE ON COOLANT LEVEL  1MDICATOR EPR FB-510  75.0 S C C A M N 0000 00.0 00.2 00.2 1 00.0 ADDED 6 GALLONS ANTIFREEZE TO COOLANT  76.0 U C C A M N 0000 00.0 01.1 02.2 2 00.0 GAL OF-10 TRANSHISSION  RESERVIOR  77.0 S C C A M Y N 0000 00.0 01.1 02.2 2 00.0 GAL OF-10 TO TRANSHISSION  RESERVIOR  AMELIA WIREL TO UNCOUPLE AND CHECK ADDITION  77.0 S C C A M Y N 0000 00.0 01.1 02.2 2 00.0 GAL OF-10 TRANSHISSION  77.0 S C C A M Y N 0000 00.0 01.1 02.2 2 00.0 GAL OF-10 TRANSHISSION  77.0 S C C A M Y N 0000 00.0 01.1 02.2 2 00.0 GAL OF-10 TRANSHISSION  77.0 S C C A M Y N 0000 00.0 01.1 02.2 2 00.0 GAL OF-10 TRANSHISSION  77.0 S C C A M Y N 0000 00.0 01.1 02.2 2 00.0 GAL OF-10 TRANSHISSION  77.0 S C C A M Y N 0000 00.0 01.1 02.2 2 00.0 GAL OF-10 TRANSHISTOR  77.0 S C C A M Y N 0000 00.0 01.1 02.2 2 00.0 GAL OF-10 TRANSHISTOR  77.0 S C C A M Y N 0000 00.0 01.1 02.2 2 00.0 GAL OF-10 TRANSHISTOR  77.0 S C C A M Y N 0000 00.0 01.1 00.1 1 00.0 REPLACE OF ITTING IN AIR MANIFOLD EPR  77.0 D O A C M N 2407 00.0 01.0 02.1 00.1 1 00.0 REPLACE OF ITTING IN AIR MANIFOLD EPR  77.0 D O A C M 1200 00.0 02.5 03.5 2 00.0 REPLACE RIGHT HAND DOLLY WHEEL CONIROL  77.0 D C C M 1 T T 2403 00.0 02.5 03.5 2 00.0 REPLACE RIGHT HAND DOLLY WHEEL CONIROL  77.0 CABLE ASSEMBLY  77.0 CABLE ASSEMBLY  77.0 C A M Y T 2403 00.0 02.5 03.5 2 00.0 REPLACE RIGHT HAND DOLLY WHEEL CONIROL  77.0 C A M Y T 2403 00.0 02.5 03.5 2 00.0 REPLACE RIGHT OF REPLACED TITION  77.0 C A M Y T 2403 00.0 02.5 03.5 2 00.0 REPLACE RIGHT OF THE ASSEMBLY  77.0 C A M Y T 2403 00.0 02.5 03.5 2 00.0 REPLACE RIGHT OF THE ASSEMBLY  77.0 C A M Y T 2403 00.0 02.5 03.5 2 00.0 REPLACE RIGHT OF THE ASSEMBLY  77.0 C A M Y T 2403 00.0 02.5 03.5 2 00.0 REPLACE RIGHT OF THE ASSEMBLY  77.0 C A M Y T 2403 00.0 02.5 03.5 2 00.0 REPLACE RIGHT OF THE ASSEMBLY  77.0 C A M Y T 2403 00.0 THE ASSEMBLY  77.0 C A M Y T 2403 00.0 THE ASSEMBLY  77.0 C A M Y T 2403 00.0 THE ASSEMBLY  77.0 C A M Y T 2403 00.0 THE ASSEMBLY  77.0 C A M Y T 2403 00.0 THE ASSEMBLY																		
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	15 C8129	15-3			3	9	000	101	341	N 80	0=01	LIFE	= UNK	CONT	ROL	CAB	SLE ASSEMBLY	

						!			666(5-1)		1			
MCKN	205	530	549	570		920	1		996					
DESCRIPTION	00.0 REPAIRED AND STRAIGHTENED FENDER + ENGINE S DE PANELS. STRAIGHTENED FUEL TANK MOUNTING BRACKETS EPR FB-507	00.0 PERFORMED SO HOUR MAINTENANCE EPR F8-530	00.5 DRAIN CONTAMINATED FUEL FROM FUEL TANK, FUEL LINES, AND FUEL FILTERS. EPR F8-549	00.0 REPLACED POSITIVE BATTERY CLAMP, EPR F8-570	ELECTRICAL, POSITIVE BATTERY BOX	09.0 TROUBLE SHOOTING TRYING TO FIND CAUSE OF VEHICLE ONLY HOVING IN 3RD GEAR-2 BROKEN MIRES WERE FOUND IN THE ELECTRICAL WIRING HARNESS. THESE WERE REPRIED AND THE PROBLEM WAS CORRECTED FOR FRESS.		00.0 ADDED 1 GALLON OF ANTI-FREEZE	00.0 REPLACED PACKING AND BACK-UP RING ON ROTARY HANIFOLD SPOOL VALVE EPR.	FB-566 (S-1)	dn	00.0 ADDED 2 QUARTS OF HYDRAULIC OIL	00.0 ADDED 3 GALLONS ANTIFREEZE	
DA PA	8		1	00	ELE		-	8	2		PACKING PACKING RING, BACK-UP			:
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DI II AH GE DESCRIPTION	00.0 REPLACED BROKEN FORMARD AND REVERSE ELECTRIC CONTROL SWITCH ROD. EPR F9-588 ELECT. CONTROL	00.2 REPLACED AUTOMATIC DRAIN VALVE ON CURBSIDE AIR RESERVOIR EPR F8-502 DRAIN	10.2 1 00.0 REPLACED BURNED OUT LAMP IN ROADSIDE TAILLIGHT. EPR F3-603 LAMP, INCANDESCANT, ROADSIDE TAILLIGHT	00.0 PERFORMED 1000 HOUR MAINTENANCE EPR F9-611	FILTER ELEMENT, DIL, FULL FLOW FILTER ELEMENT, DIL, BYPASS CARRIDGE, FUEL FILTER FILTER ELEMENT, DIL, TRANSHISSION FILTER ELEMENT, WATER, CORROSION RESIST FILTER ELEMENT, WATER, CORROSION FILTER ELEMENT, WATER, AXLE VENT ASSY, BREATHER, AXLE VENT ASSY, BREATHER, HOHT VENT ASSY, BREATHER, TRANSHISSION FILTER ELEMENT HYDRAULIC RESERVOIR FILTER ELEMENT HYDRAULIC RESERVOIR	00.0 TIGHTEN PANTOGRAPH ARM ASSEMBLY EPR F8-607 00.0 RE-HELD REAR CURBSIDE FENDER BRACKET EPR F8-606	00.1 ADDED 1 QUART OIL TO ENGINE (OE-50)
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	w	a &	u		929		149		019	702	707		-51849		712		720	720
	I	K AM		00.1 1 09.1 ADDED 1 GALLON OF DIL TO ENGINE	04.5 3 00.0 REMOVED WHEEL AND TIRE, REMOVED OLD TIRE FROM WHEEL, MOUNTED NEW TIRE ON WHEEL, PEINSTALLED WHEEL AND TIRE ON VEHICLE, EPR FB-626	TIRE PHJEMATIC 23X21, 20PR REAR CURBSICE WHEEL	11.4 2 00.2 REPLACED LH BRAKE ASSEMBLY EPR F3-641	LH BRAKE ASSEMBLY AXLE	06.6 3 08.0 50 HOURS SERVICE EPR F8-640	00.2 1 00.1 RE-TORQUED FENDER HOUNTING CAPSCREWS PART NO. 17C-820H EPR F8-702	00.2 1 00.0 REPLACED PANTOCRAPH ARM ASSEMBLY. ROADSIDE VISION PANEL, REMOVED CURBSIDE WIPER ASSEMBLY EPR FB-707.	PANTOGRAPH ARM ASSY ROADSIDE VISION FANEL	00.3 1 00.0 REPLACED CURBSIDE VISION FAMEL EPR F8-648(S-1)	PANEL, VISION	09.9 2 03.0 CHECKED ELECTRICAL SYSTEM REPLACED CONNECTOR IN K-4 RELAY BASE EPR FB-712	PIN, RELAY BASE	00.2 2 00.0 STRAIGHTENEO REAR ROADSIDE HEADLAHP Guaro epa F8-720	00.2 2 00.0 STRAIGHTENED EDGE OF HYDRAULIC TANK EPR FG-720
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61/50/10	D S OHR A		w	28/01/78 1 01024 095.0	28/01/75 1 010?9 036.0	PARTS 2507913	31/01/78 1 01039 037 CHITICALITY FACTOR= 1	PARTS FF71118	03/02/78 1 01049 098.0	03/02/78 1 01049 099.0	03/02/78	PARTS C-1505-L	07/02/78 2 01067 100.0	PARTS 2545874	38/02/78 2 01070 10 CRITICALITY FACTOR=	PARTS UNKNOWN	82/20/60	03/02/18

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The second secon		DESCRIPTION	DA. 2 CHECKER LUBDICATION CYCTEM FOO ES_716	01.4 ALIGNEO TRANSHISSION MOUNT AND	TIGHTENED BOLTS EPR FB-712(S-1)	03.9 DIAGNOSED TRANSMISSION SHIFTING PROBLEM REPLACED L-10 SHIFT SOLENDID EPR F8-712(S-1)		03.3 TESTED MODULATOR LOCK-UP CIRCUIT REPLACED SPEED CONTROL SMITCH EPR FB-743	SWITCH, ELECTRIC CONTROL	00.0 ADDED 2 GALLONS HYDRAULIC OIL	00.0 RE SET HYDRAULIC PRESSURE ON DOLLY WHEEL CYLINDERS TO 2100 P.S.I. (FOR AIRCRAFT LOADING AS PER EMO) EPR FB-815	00.0 REPLACED THE ROADSIDE DOLLY WHEEL CYLINDER PISTON ROD. EPR FB-810	DOLLY CYLINDER RJADSIDE DOLLY WHEEL	00.0 PERFORMED 50 HOUR MAINTENANCE EPR F8-841	INSTALLED SEAL KIT ON STEERING CONTROL VALVE EPR FB-177	REPAIR	REPLACED HOSES WHICH CONNECTS BETWEEN THE FULL FLOW OIL FILTER AND OIL COOLER AND ENGINE. EPR FB-989	
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				DESCRIPTION	TIGHTENED ENGINE COMPARTHENT REAR PANEL MOUNTING BOLTS. EPR FB-995	TIGHTEN SURGE TANK HOUNTING BRACKET 80LTS. EP? F8-995	TIGHTENED TURBOCHARGER MOLNTING BRACKET BOLTS. EP? FB-995	REPLACED EXCESSIVELY WORN TIRE. EPR FB-995	TIRE Packing, preformed	TIGHTENED LOOSE GROUND MIRE ON SERVICE LIGHT. EPR FB-995	INSTALLED BOLT + NUT ON SPEED LIMITER CONTROL LIMKAGE AS A TEMPORARY FIX. EPR FB-995
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U3/05/79 MAINTENANCE TASK				1	23/05/78	23/03/78	23/03/78	23/03/78	PARTS 2507913	23/03/78	23/03/78
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					OESCRIPTION	0.2 CHECKED PLANETARY DRIVE FLUID LEVEL, ADDED 400 ML TO CURBSIDE, 300 ML TO ROADSIDE, EPR FB-30.	RE-30.	BULB, INCADESCENT, CURBSIDE, TAIL	.2 ADJUSTED SERVICE BRAKES. EPR F8-30.	00.1 WELDED CRACK IN SFRAY HEAD HAC SHOULD BE CHANGEJ FROM O TO F FOR THIS REPAIR EPR F8-128	00.1 00.1 1 00.0 TIGHTENED THO BOLTS ON PARKING BRAKE LEVER EPR FB-126	50 HOUR MAINTENANCE A. ADDED 40-50 MLS OIL TO MIDMOUNT BEARING. EPR F8-1071	00.2 1 00.0 INFLATE TIRE TO 55 P.S.1. TIRE HAD LOW PRESSURE (40 P.S.11.	HATER HOSE BENT OUT OF SHAPE- HOSE CONTAINED MATER PART MAY UP HOSE EXPANSION OR SWELL PLUS BOUNCING DURING POREATION CAUSED COVER AND TO BEND OUTMRO-PROBABLE GAUSE, LEAKING SHUT-OFF VALVE, REMCVED HOSE AND POUNDED HOSE BOX BACK INTO SHAPE, EPR F3-161.	00.0 50 HOUR MAINTENANCE A. ADDED 70 ML. OIL TO MONT. BEARING. EPR F8-1072	1.0 REMOVED METALLIC DEBRIS FROM WATER PUMP IN DISTRIBUTOR, EPR F8-205
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	00.0 PERFORMED 50 HR. MAINT EPR F8-1074	EPR		00.0 REPLACE) BURNED OUT TAIL LIGHT (RIGHT READ) EPR FB-239		00.0 RE-STRAIGHTEN SIGHT GUARD. GUARD WAS BENT WHEN DISTR, HIT A TREE LINB EPR FB-242	PER LUBE	PER LUBE	OIO	FROM	00.0 INFLATED LEFT REAR TIRE TO 55 PSI.	D REMOVED CRACKED SPRAY HEAD AND INSTALLED NEW SPRAY HEAD. SPRAY HEAD HAD CRACKED COMPLETELY ACROSS THE MIDTH OF THE FEMALE END. THROUGH THE THERADED HOLE FOR THE SET SCREW. THE SET SCREW SPRAY HEAD ON THE DISCHARGE PIPE. EPR FR-413
	9	250 HOUR MAINTENANCE		IGHT		CUA			00.0 ADDED 4 QTS OF TRANSMISSION FLUID	PSI.	55	100.0 REHOVED CRACKED SPRAY HEAD AND INSTALLED NEW SPRAY HEAD. SPRAY HEAD. SPRAY HEAD. SPRAY HEAD. SPRAY HEAD. SPRAY HEAD. SPRAY HE ST SCREW, THE SCREW, THE ST SCREW, THE ST SCREW, THE ST SCREW, THE SCREW, THE SC
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	£	H 05	20 C	ENED 239		Z Z	H-12	HR-12	10	1	1 8	RACKED SPRAY HEAD. SIEW SPRAY HEAD. SOCHPLETELY ACROULE END. THROUGH FE SET SCREW. THE PREVENT ROTATION ON THE DISCHARGE
No.	0 5		VENT ASSY, BREATHER, AXLE Vent assy, breather, midmount Filter Element, fl, pomer cluster	O REPLACE) BURNE READ! EPR F8-239		GHTE DISI	00.0 PERFORMED 50 HR ORDER LOS209-12	00.0 PERFORMED 50 HR MAINTENANCE ORDER LOS209-12. EPR FB-407	915	INFLATED TWO TIRES TO 55	LEF	D REMOVED CRACKED SPRAY HEAD. SI INSTALLED NEW SPRAY HEAD. SI HAD CRACKED COMPLETELY ACRO; OF THE FEMALE END. THROUGH HOLE FOR THE SET SCREW. THE IS USED TO PREVENT ROTATION SPRAY HEAD ON THE DISCHARGE
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DE SCRIPTION	ERF	00.0 PERFORMED FB-1082	BREATHER, Breather, Ient, fl,	LE PL	LAMP, INCANDESCENT	0 RE-S BENT W	ER	ER	BOOL	INFL.	NFL	D REMOVED INSTALLED THAD CRACKE OF THE FEM HOLE FOR TIS USED TO SPRAY HEAD
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0ESCRIPTION	00.0 PERFORMED 50 HR MAINTENANCE PER LUBE ORGER LO5209-12 Added 42 ML of Dejho To the Midmount Bearing. Epr F8-444	00.0 PERFORMED SO HR MAINTENANCE PER LUBE ORDER LOS- ~209-12. EPR F8-445	88.8 COMPLETED 588 HR MAINTENANCE EPR F8-428	VENT ASSY, BREATHER, MIDMOUNT VENT ASSY, BREATHER, AXLE Filter Element, Fl, Pomer Cluster	00.0 PERFORMED SO HOUR SERVICE PER LUGE ORDER LOS209-12. ADD 15 ML OF LUGRICANT TO MIDMOUNT. EPR F8-425	00.0 REPLACED CURBSIDE BRAKE LIGHT EPR F8-424		ACED CURBSIDE CLEARANCE LIGHT, LAMP	LAMP INCADESCENT CURBSIDE CLEARANCE LIGHT	00.0 REPLACED CURBSIDE TAILLIGHT EPR F8-414	LAMPINGADESCENT CURBSIDE COMPOSITE LITE	00.0 50 HOUR MAINTENANCE IT TOOK 3 HEN 1.25 HOS TO UNCOUPLE TH HODULES IT TOOK 3 HEN .50 HRS TO COMPLETE MAINTENANCE AND RECOUPLE. EPR FB-428,429	00.0 COMPLETED SO HOUR MAINTENANCE EPR
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DESTRIPTION	00.0 REPLACE DEFECTIVE ROADSIDE TIRE EPR F3-433	TIRE, PHEUMATIC  00.3 1 00.0 PIPE TO HOSE ADAPTER LEAKING AT INTAKE  MANIFOLD, REMOVED THE ADAPTER AND  PAINTED PIPE SELLANT ON THREADS OF  INTAKE MANIFOLD. EPR F8-435	01.2 2 00.0 PREFORMED 250 MR. MAINTENANCE EPR FB-436 VENT ASSY, BREATHER, MIDHOUNT	VENT ASSY, BREATHER, AXLE FILTER ELEMENT, FL. POWER GLUSTER 17.1 2 80.0 MELD STEEL STIFFNER 3.5° X 2" TO INSIDE	1	REPLACED MANHOLE COVER LATCH. THE LATCH HAD PREVIOUSLY BEEN BROKEN AND A NEW DESIGN MAS INSTALLED. EPR FB-185(S-1)	GP=000091811 NO=01 LIFF=485.1 LATCH, MANHOLE COVER	00.0 PERFORMED 50 HOUR MAINTENANCE ADDED 22.4 ML OF OIL TO MIDMOUNT BEARING EPR F8-439	00.0 50 HOUR MAINTENANCE ADD 30 ML OF Lubricant to midhount bearing. EPR FR-484	00.1 REINSTALLED BOUNET ON GATE VALVE FIRE
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C TEST .FAMECEL TEST LITEH ,936  A S E T Q A C G CO CH HH H D DT  S U H H		PRIMED PUMP ON SPRAYING SYSTEM LLING MATER TANK EPR F8-716	COMPLETED SO HOUR MAINTENANCE -	REPLACED CURBSIDE COMPOSITE LIGHT Sembly Epr FB-807	IIE Installed new coupling, new rei d new actuator on work section dmounibearing asst, epr f8-914		REPLACED HOSES ON AIR MANIFOLD	REPLACED ACTUATOR AND COUPLING		REPLACED LUBRICATION FITTING IN	ICATION	REPLACED HIDHOUNT BEARING BREATHER NT. EPR FB-997
G TEST FAHECEL TEST 11EH ,936 T S E E T Q A C G CO CH A H S R OL LO A A S U H H T T F P NY OUU N S U H H T T F P NY OUU N S U H H T T F P NY OUU N S U H H T T F P NY OUU N S C C A H Y N 7471 00.0 00.5 Z4.0 U C C A H Y N 7471 00.0 00.5 Z4.1 U F F A C N N 0609 00.0 00.7 Z5.0 U O O A H Y N 1206 00.0 00.7 Z5.0 U O O A H Y N 1206 00.0 00.7 Z5.0 U O O A H Y N 1206 00.0 00.0 00.8 Z5.0 U O O A H Y N 0900 00.0 00.0 00.8 Z5.0 U O O A H Y N 0900 00.0 00.8 Z5.0 U O O A H Y N 0900 00.0 00.0 00.8 Z5.0 U O O A H Y N 0900 00.0 00.8 Z5.0 U O O A H Y N 0900 00.0 00.8 Z5.0 U O O A H Y N 0900 00.0 00.8 Z5.0 U O O A H Y N 0900 00.0 00.0 00.8 Z5.0 U O O A H Y N 0900 00.0 00.0 00.8 Z5.0 U O O A H Y N 0900 00.0 00.0 00.8 Z5.0 U O O A H Y N 0900 00.0 00.0 00.8 Z5.0 U O O A H Y N 0900 00.0 00.0 00.8 Z5.0 U O O A H Y N 0900 00.0 00.0 00.0 00.8 Z5.0 U O O A H Y N 0900 00.0 00.0 00.8 Z5.0 U O O A H Y N 0900 00.0 00.0 00.0 00.8 Z5.0 U O O A H Y N 0900 00.0 00.0 00.0 00.0 00.8				00.00 AS	4 F	258	1	•			16, 1489	
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03/05/79 HAINTENANCE TASK LOG D S OHR A A H DON C T F OUD T E T HRS N	S OHR H DON F OUD	0 4 0 F Z	X S C C	WUI	" moza	A - E - N	FAMECE1 C M A M A M A M A M A M A M A M A M A M		S C F S	EST 11EH C G CO S R OL F P NY	CO CC C	62 00 00 83 83 83	H 4 5 5 8	DH40	OT IT	DESCRIPTION	waan
18/09/77 2 273.2 001.00	2 273.	2 001		8 8	9 0	4 4	ပပ	z z	N 1802 N 2201		0.00	4.00	4.00		000.00	00.0 INSTALL MINDSHIELD & WIPER ASSEMBLY 00.0 ASSEMBLE AND INSTALL CAB RACK FRAME EPR	*
18/08/77 2 273.2 001.08 18/03/77 2 273.2 001.0C	2 273.	2 001		5 5	0 0	4 4	ပပ	zz	N 1801 N 2202		0.00	01.0	01.0		0.00	00.0 INSTALL "ROPS" ON POWER SECTION 00.0 INSTALL RFARVIEW SIDE MIRRORS	
26/08/77 1 274.9 CRITICALITY FACTOR=	FACT		1.1 0	2 2	U	•	O	-	Y 0000	000	0.0	1.5	3.0.2	~	0.0	0.0 EXPERIENCED DIFFICULTY IN UNCOUPLING	. 95.
27738/77 1 277.7 001.2 CRITICALITY FACTOR= 1.00	1 277.		1.00	0	0	4	O	-		0114	0.00	0.,0	0.60	~	06.0	06.0 REPLACES DIRECTIONAL CONTROL VALVE. EPR F8-96	96
29/03/77 1 277.9 00	277.		2.0 U	3 0	0	000	0	7 >	1414 NO=(	=	000.0	E=UNK 02.8		7 10	NAL C	DIRECTIONAL CONTROL VALVE 02.8 1 00.0 REPLACED HOSE BECAUSE OF PIN HOLE	8615-
CRITICALITY FACTOR= 1. PARTS 3230781-16-026	FACT		1.00	5	1 8	000	101	3	=======================================	GP=000011411 NO=01 LIFF=UNK	113	= CNX	HOSE NH		37	LEAKS, EP? F8-86(S-1)	
01/03/77 1 278.1 00	. 875	1 002	2.08 U		0	4	ပ	-	N 1411	111	0.00	6.00			00.2 HR	00.2 REPLACE HOSE DUE TO INSTALLATION OF Hrong hose to begin mith EPR FB-5315-1	5315-
PARTS 242R4-JSN4-J90S4 01/09/77 1 278.1 003.0	24-JSN	1 003		ນີ້ ບ ກ	~ U	00 4	C C	* Z	7 11 4 N	GP=000011411 NO=01 LIFE=UNK C G A G N N 0000 00.0 00.	0000	=UNK 00.2	HOSE, NH	ž	00.00	00.0 ADD 6 1/2 GALLONS OF HYDRAULIC - FLUID TO TANK	
03/09/77 2 297.3 006.0	2 297.			0	0	4	S	>	U O O A C Y Y 2402		0.00	01.8	03.6 2		00.3 PP	PRESSURE RELIEF VALVE, REMOVING VALVE, REPLACING VALVE, REPLACING "O" RING + RE-INSTALLING EPR	29
PARTS 1 PP11-F61-65	11-F6	1-65		ی	4	000	100	54	20	GP=000012402 NG=01 LIFF=	LIFE	,,	ORING.	I	ICH P	ORING, HIGH PRESSURE RELIEF VALVE	

waan	69 69	150	2	95	911	36,123	
H DT E IT H AH GE DESCRIPTION	00.1 1 00.0 ADDED 4 GALLONS DE 10 HYDRAULIC 10.4 1 00.0 HYDZAULIC HOSE FITTING REFLARED EPR 58-69 00.2 1 00.0 REPLACED HOSE AND RE-TIGHTENEO EPR	REPLACED HOSE  100.5 1 00.0 PERFORMED 50 HR LUBRICATION ADDED 150 HL OF BRAKE FLUID . RETORQUED BOLT ON PIO DRIVE -SCRAPER BEARING BRACKET EPR	00.1 1 00.0 RE-ATTACHED WARNING FABLE WHICH HAD FALLEN OFF THE UNIT DURING WASHING. 09.1 1 00.8 RE-INSTALLED WARNING DECAL ON GRADER. CAME OFF DURING WASH DOWN EPR F8-78	00.2 1 00.0 A NEW MUT SECURING THE PANTGRAPH ARM ASSY MAS INSTALLED. BECAUSE THE ORIGINAL MUT FELL OFF EPR F8-82 NUT, SLFLKG, HEX PHOS CTG 03-48 UNC	00.2.1.00.0 INSTALLED BOLT MUT AND WASHER TO SECURE THE ROD END OF DOLLY WHEEL ASSY TIGHTEN HOSE FITTING-LEAKING-THE DOLLY WHEEL HIT THE TOP OF A BANK WHILE GRADING .  BROKE THE TOP SUPPORT EPR F8-116	1.5 1 00.5 TIGHTENED HOSE FITTING ( PAD TO PULL STEERING WHEEL ETC. 1 EPR FB-98.123	09.1 1 09.0 ADDED 3 GALLONS OF COOLANT TO RADIATOR COOLANT LEVEL MAS LOW
I Q Z	99.4 99	· w	90.1 90			01.5 01.5 1	00.1 00
6. 93988	0 0 0	LIFE=U	8 6 6	DO.O.	0.0	0.00	0 0.00
TEST , FAMEGE1 TEST ITEM , 939 T S E E T Q A C C C C C C C C C C C C C C C C C C	S C C A C N N 0000 U 0 0 A C Y N 2406 U 0 0 A M Y Y 2406	S C C A C Y N 0800	U Q Q A C Y N BB08 U O O A C Y N 8115	U O O A C Y Y 2202 00.0 00.2 6P=000012202 NO=01 LIFE=	U 0 0 A C N N 2407 00.0 00.2	U.O 9 A C T T 1411	S C C A M M M 0501
03/05/79 MAINTENANCE TASK LOG T D S OHR A T A H DON C A T F OUD T S E T MRS N K	03/09/77 2 300.0 005.0A 03/09/77 2 300.6 007.0 07/09/77 1 300.6 607.0A	PARTS 56.524284JS44J90S	793777 1 301.6 009.0	09/09/77 2 302.3 010.0 PARTS 500-3H	12/03/77 2 306.1 011.0	14/09/77_1 313.6 012.0 CRITICALITY FACTOR= 1.00	15/09/77 2 323.1 013.0
HAI O A L	93	4 8	8 8	5 4	12	1 13	15

m c & c	•		62 (5-1)			1092			£13		1095		146 (5-1		
OT II AM AM	DESCRIPTION	00.0 ADJUSTED TIRE PRESSURE TO 55 P.S.1. THE TIRE PRESSURE MAS LOW	02.6 2 00.5 REPLACED RELIEF VALVE. EPR F8-6215-11	VALVE, RELIEF	00.0 ADDED 3 GALLONS DIL TO HYDRAULIC RESERVOIR	00.0 CHANGED TRANSHISSION FILTER AS DIRECTED 97 C.E.C. REP EPR FB-1092	ELEMENT ASSY, TRANSMISSION OIL FILIER	00.0 ADD 1 GALLON OF OIL TO TRANSMISSION	00.0 TIGHTENED DRAIN FITTING ON TRANSHISSION OIL FILTER SHELL ASSEMBLY. ( SLIGHT SEPAGE MAS NOTICED APOUND FITTING DURING INSPECTION OF VEHICLE AT CLOSE OF A DAY'S OPERATION. ) EPR FB-173	88.8 ADDED 1 GALLON OF COOLANT TO THE RADIATOR	60.0 INSTALLED TRANSMISSION FILTER EPR F8-1095	GP=000010721 NO=01 LIFF=005.9 ELEMENT, FILTER	00.0 REMOVED AND INSTALLED NEW SELECTOR VALVE. EP? F8-146(S-1)	VALVE, SELECTOR	00.0 ADDED 4 QUARTS OF ENGINE CIL ADDED 6 QUARTS HYDRAULIC DIL
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				No.		00.0 INSTALL DOLLY WHEEL SHUT OFF VALVE. EPR F8-194	00.1 REPLACED HOSE ASSEMBLY. IT HAS LEAKING PROFUSELY. EPR F8-187	, N.H. J9054	00.1 REPLACED HOSE END FITTING 0EP5-201-20EP09C184, FIG 140 1TEM 53 EPR FB-6915-2)	GP=000012406 NO=01 LIFE=068.4 HOSE END FITTING	00.0 ADDED 2 1/2 GALLONS OF GO-90 TO THE RIGHT WHEEL.	00.2 CLEANED OUT SAFETY RIM OF LEFT REAR TIRE TO TRY TO ELIMINATE CHAFING NOISE. EPR F8-1096	00.1 TIGHTEN LUG NUTS (HUB BOLTS ON ROADSIDE WHEEL.) EPR F8-201	00.0 ADDED 1 GALLON HYDRAULIG FLUID	00.1 PERFORMED 50 HOUR MAINTENANCE EPR F8-1075	00.0 INSTALL LR AXLE STOP (REMOVED AXLE STOP FROM ANOTHER P.S. EPR FB-214	DO.O ADDED 4 GALLOS OF HYDRAULIC OIL	00.2 REPLACE FLARED TUBE FITTING WHICH ATTACHES TO "DINGER VALVE". THE FITTING'S FLARE WAS WORN BEYOND REFLARING, AND HAD TO BE REPLACED THIS IS A RECURRING INCIDENT EPR FB-227 (69-1)
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03/05/79 HAINTENA					*	60	99	115	603	IIS	60	60	60	60.	60	60	110	5
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PARTS 242R4-JSN4-J90SL4 GP=000012406 NO=01 LIFE=158.6 HOSE ASSY, NON METALIC

D-61

maan	528	1078		228	1037
H DT E IT N AH GE DESCRIPTION	00.3 1 00.0 ADD APROX 1 PINT OF G O GC TO DIFFERENTIAL 00.2 1 00.0 RE-WELD TANK TO ITS SUPPORTING BRACKET. OLD WELD 1AD BROKEN EPR FB-228	.6 2 00.0 COMPLETED 500 HOUR MAINTENANCE. EPR FB-1078	ELEMENT, OIL, FULL FLOW ELEMENT, OIL, BYPASS OGE, FUEL FILTER ELEMENT, OIL, TRANSMISSION ELEMENT, MATER, CORROSION RESIST ELEMENT, FL, POWER CLUSTER SSY, BREATHER, MOMI SSY, BREATHER, TRANSMISSION AIR	00.4. 2 INSTALLED CANVAS CAB ASSEMBLY, (TH DEP 5201-20+P INADEQUATE TH STATES THE PERTY PAGE 2-80 TLUSTRATIONS FIG 2-17C; PAGE 2-80 C + FIGURE 132; PAGE C-172 SHALL BE SUPPLIED LATER.) 00.5 1 00.0 MELD MODIFIED FUEL TANK MOUNTING BRACKET FO THE FRAME - (THIS IS A CLARK EQUIP TO MODIFICATION THAT WILL BE INSTALLED IN ALL POWER SECTIONS ) EPR F3-228 (S-1)	RE-OPERATIONAL CHECK, CREW I. OF HYDRAULIC OIL TO THE RESERVOIR. LOOSE BATTERY CABLE EPR FB-1097
I Q D a	00	9.50	FIRETINGSET	8 8	8 .
ST , FAMECE1 TEST ITEM ,939 SEET QAC G CO CH / CCMAHS R OL LO UHH' IF P NY OU R S T CR	026.04 U O O A C Y Y 1501 00.0 00.2	S O O A H Y N 8000 00.0 02.8	GP=000010106_NQ=02_LIFE= 000010106_02 000010721_01 000010721_01 000011202_01 00001100_01 00001100_01 000010700_01	U O O A C N N 1501 00.0 00.5	2 2
03/05/79 MAINTENANCE TASK LOG TE U S OHR A T A H DON C A A T F OUD T S E T MRS N K	04/10/77 2 471.2 026.0	11/10/77 2 502.9 026.1		13/10/77 1 521.0 027.0	.7 028.1A

wa	αN	1076	284		11-492)062			162	1000		1080		288(5-1)		462 48 62		1098	335
	DESCRIPTION	PERFORMED 50 HOUR SERVICE EPR F8-1076	00.0 INSTALL PARKING BRAKE CABLE, TO REPLACE DAMAGEO PARKING BRAKE CABLE EPR F8-284	CABLE, REMOTE ACTR	00.3 REPLACED BROKEN PARKING BRAKE CASLE EPR	17-1071063-01	HOTE ACTR	00.0 REMOVED RIGHT DOOR-REMOVEC 90170M HINGE PIN 110P HINGE PIN FELL OFF) EPR F9-291	PERFORMED 50 HR. MAINTENANCE PER LUBE ORDER LOS-3840-201-12. EPR F8-1060	00.1 ADDED 4 QTS OF TRANSMISSION OIL TO THE TRANSMISSION.	DIFFICULTY IN COUPLING. EPR F8-1080	00.0 ADDED 2 QTS OF COOLANT TO THE RADIATOR.	CLEARANCE LIGHT BULB EPR FB-28815-1)	LAMP, INCANDESCENT	DO.O WELD BROKEN PIVOT BRACKET AND TOGGLE LEVER. EP? FB-293,294	A CONTRACTOR OF THE CAME OF THE CONTRACTOR OF TH	ADJUST FLOOD LIGHTS EPR F8-1098	DO.O REHOVE WINDSHIELD ASSY BY DIRECTION OF P.H. FAMECE EPR FB-335
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# 0 H	OI	18/10/77 2 556.0 030.0	18/10/77 2 556.0 030.0A	PARTS 2546146	21/10/77 2 592.0 031.0	CAITICALITY FACTOR= 1.00	FAKTS 2546146	21/10/77 2 592.0 031.0A	22/10/77 2 602.7 032.0	22/10/77 2 602.7 032.0A	22/10/77 2 602.7 032.08	25/10/77 1 607.9 033.0	26/10/77 2 627.7 034.0	PARTS HS15570-1251	27/10/77 2 631.4 035.0	CRITICALITY FACTOR= 1.00	27/10/77 2 631.4 035.0A	31/10/77 2 656.3 036.0
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03/05/79 HAINTENA D	1	7	7	F	11	11	KT	1	7	7	1	1	7	RI	11		7	7
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				DESCRIPTION		00.0 REMOVE CANVAS CAB COVER BY DIRECTION OF P.M. FAMECE EPR FB-335	SPEED CONFROL SMICHEL, DIRECTION AND SPEED CONFROL SMICHES. REMOVED BOLTS HOLDING STEERING VALUE TO COCKPIT FRAME ALLOMING ACCESSIBILITY TO STEERING VALVE. TIGHTENED HOSE CONNECTIONS EPR F9-306	00.0 REINSTALLED HANDLE ON EMERGENCY AIR CONTROL VALVE, HANDLE WAS FCUND ON FLOOR OF COCKPIT, EPR F8-34.1	01.0 REPLACED PARKING BRAKE ACTUATOR CAPLE EPR F9-342	GP=000011201 NO=01 LIFE=106.2 CABLE REHOTE ACTUATO?	PERFORMED 50 HR MAINTENANCE EPR F8-1077	01.2 02.4 2 00.0 REINSTALLED CANVAS CAB COVER	0.2 REPLACED PROPSHAFT TO MID MOUNT BEARING EPR FB-1099	U JOINT ASSY DOUBLE MIDHOUNT BEARING	00.0 ADDED 4 QUARTS OF HYDRAULIC OIL		HUUKS . Z HEN X .Z HKS EFK FU-11013-11
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mean	116 (S-1)	398	343(5-3)		394		336(5-1)		-	1079	
OT III AM GE DESCRIPTION	00.5 1 00.0 REPLACED DOLLY CYLINDER ON CURBSIDE. EPR F3-116(S-1) DOLLY CYLINDER	00.0 REPLACE) BURNED OUT CURBSIDE FLOOD Light efr fb-30a	00.0 MELD HOJD HINGE - BROKEN IN ACCIDENT ON 7 NOV 77. EPR F8-343(S-3)	00.1 ADDED 1 GALLON OE-10 OIL TO HYDRAULIC RESERVOIR. ADDED 3 QUARTS ANTI- FREEZE TO COOLIN; SYSTEM.	00.1 HOSE ASSY FROM WATER PUMP TO CORRESION RESISTOR FILTER ASSY SHUT-OFF VAVLE LEAKING AT VALVE. TICHTENED HOSE CLAMP. EPR FB-394	00.0 ADDED 1 GALLON OF OIL TO ENGINE	00.0 REPLACED AUX. STEERING CONTROL CABLE ASSY EPR FB-336(S-1)	CABLE ASSY	00.1 ADDED 1 QUART OF LUBRICANT (GO) TO RIGHT REAR PLANETARY ASSEMBLY	00.0 COMPLETED 250 HOUR MAINTENANCE EPR F8-1079	FILTER ELEMENT, DIL, FULL FLOW FILTER ELEMENT, DIL, BYPASS CARRIDGE, FUEL FILTER FILTER ELEMENT, DIL, TRANSHISSION FILTER ELEMENT, MATER, CORROSION RESIST FILTER ELEMENT, FL, POWER CLUSTER VENT ASSY, BREATAER, MONT
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	9.00	00.2 LAMP	00.1	00.3 1	00.3	2.00	0.70	CONTROL	00.3	05.0	FILTER CARTRIC FILTER FILTER VENT AS
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25 25988	0 0 A C H M 2407 00.0 00.5 GP=000012407 NO=01 LIFE=UNK	00.2 E=UNK	00.1	90.3	900.3	00.5	0.7.0	F=UNK	00.3	02.5	LIFF=290.1 290.1 290.1 290.1 290.1 290.1
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mera			653				617			959	859		576	456,457	534
	, AXLE , TRANSHISSION	6 QUARTS OF TRANSMISSION OIL	DEFECTIVE HYDRAULIC PRESSURE F8-653	/RLV	2 GALLONS OE-10 TO HYDRAULIC	4 QUARTS OF TRANSHISSION OIL	00.1 REINSTALLED STR HEADED PIN, AND REPLACED COTTER KEY, AUX. STEER CONTROL GABLE, EP? F8-617	KEY AUX STEER CONTROL CABLE, ROD END	O ADDED 2 0TS, OF TRANSMISSION FLUID TO THE TRANSMISSION ASSEMBLY DURING PRE OPERATION INSPECTION	AND REPAIRED BATTERY CROSSOVER 8-656	BROKEN DRAIN VALVE IN AIR EPR F8-658		TTERIES. STARTED VEHICLE WITH SOURCE. EPR F8-576	NON-ADJUSTABLE + ADJUSTABLE EPR F8-456,457	62.0 LOSS OF AIR PRESSURE, PARKING BRAKE 51 ENGAGED REMOVED LOCKING PIN, FROM SPRING BRAKE CHAMBER PISTON ROD PART
DESCRIPTION	BREATHER,	00.0 ADDE 0 6	00.3 REPLACE VALVE EPR	PRESSURE ROC/RLV	00.1 ADDED 2 RESERVOIR	00.0 ADDED 4	REPLACE CABLE. E	T AUX STE	DO. 0 ADDED 2 THE TRANSH OPERATION	00.1 CLEANED AND RI LEAD EPR F8-656	00.1 REPLACE RESERVOIR	NIN	6xTERNAL	00.0 REPLACED AXLE STOPS	ENGAGED SPRING
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DESCRIPTION	00.0 ADDED 2 QUARTS ENGINE OIL	00.0 ADDED 1/2 GALLON TRANSMISSION FLUID	EZ	MEASSTRUCED PLANEIMENTS, MARELS + TIRES, ADJUSTED BRAKES, INSTALLED L. H. BACKING PLATE ASSY EPR FB-492	PLATE ASSY L. H.	00.0 ADDED 11 QUARTS OF GO-90 AND 1 PINT OF BRAKE FLUID AS A RESULT OF DISASSEMBLY AND REPAIR OF BRAKE ADJUSTERS	00.0 ADJUST SERVICE BRAKES ON GRADER POWER SECTION EPR FB-505		00.0 ADDED 2 GALLONS HYDRAULIC OIL	PERFORMED 50 HR MAINTENANCE PER LUBE ORDER 605-3840-201-12 EPR FB-536	00.0 ADDED 2 QUARTS ENGINE OIL	00.0 ADDED 3 GALS. OF HYDRAULIC FLUID.	00.0 ADDED 1 GAL. OF ENGINE OIL.	00.0 ADDED 3 GALLONS HYDRAULIC FLUID	00.1 HEATED AIR MANIFOLD COUPLING TO FREE ICE FROM CHECK VALVE EPR F8-546
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mean	61.		99	689	713	916
DT II AH GE DESCRIPTION	00.0 ADDED 2 GALLONS HYDRAULIC OIL 00.0 REPLACED TRANSMISSION FILTER PACKING EPR F8-618	GP=000010721 NO=01 LIFF=177.8 PACKING, PREFORMED C C A M N N 0000 00.0 00.2 00.2 1 00.0 ADDED 2 QUARTS OF TRANSMISSIOM OIL C C A M N N 0000 00.0 00.2 00.2 1 00.0 ADDED 2 QUARTS OF ENGINE OIL	00.0 ADDED 3 QUARTS OF ENGINE OIL 00.0 ADDED 2 QUARTS OF TRANSMISSION OIL 00.1 REPLACED STR HEADED PIN PART 2F-09062? MITH A BOLT OF SIMILAR SIZE PIN NOT AVAILABLE. STR HEADED PIN LCCATED IN CON ROL BOX ASSEMBLY ROAD SIDE DOLLY WHEEL CONTROL CAGLE. EPR FB-608	00.1 ADDED 1 GALLON HYDRAULIC FLUID (0E-10) TO RESERVOIR 00.1 REINSTALLED REPAIRED PIVOT BRACKET PART 02547166 TIME BETWEEN REPAIRS, 354.0 HRS EPR F8-609	00.0 ADDED 2 QTS OF TRANSHISSION FLUID. 00.0 ADDED 2 QTS OF ENGINE OIL. 00.0 OPERATED THROTTLE BY HAND AND USED	ETHER TO START ENGINE EPR F9-713  14.2 3 PERFORMED 1000 HR MAINTENANCE PER LUBE FILTER ELEMENT, OIL, FULL FLOM FILTER ELEMENT, OIL, BYPASS CARTRIDGE, FULL FILER FILTER ELEMENT, OIL, TRANSMISSION FILTER ELEMENT, OIL, TRANSMISSION FILTER ELEMENT, MATER, CORROSION RESIST FILTER ELEMENT, H, POWER CLUSTER
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03/05/79 MAINTENANCE S D A A T T T T T	23/01/78 1 962.4 073.0	PAKTS 173368 24/01/78 2 976.7 074.0 24/01/78 2 976.7 074.0	25/01/78 2 982.9 075.0 25/01/78 2 982.9 075.0A 26/01/78 1 983.1 076.0	27/01/78 1 984.1 077.0 27/01/78 1 985.4 078.0 CRITICALITY FACTOR= 0.50	06/02/78 1 06/02/78 1 07/02/78 1	08/02/78 1 01001 PARTS MS-35802-3 9311 5678 LF-511 29980 AC43887
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OF SCRIPTION	VENT ASSY, BREATHER, MOMT VENT ASSY, BREATHER, AXLE VENT ASSY, BREATHER, TRANSMISSION FILTER ELEMENT HYDRAULIC RESERVOIR PACKING, PREFORMED (FOR ABOVE)	00.1 TIS-TENED FITTING ON HOSE ASSEMBLY TO CAM VALVE AIR INPUT SIDE. PART NO. 27.50, 243R4-JSN4-J4554 EPR FB-719	00.0 REPLACE ONE HISSING NUT ON THE PARKING 7 BRAKE CALIPER ASSEMBLY EPR F0-729		00.0 REPLACED PARKING BRAKE, REMOTE ACTUATOR 7 CABLE. EPR F9-732(284-2)	GP=COOO11201 NO=01 LIFE=308.7 CABLE, REMOTE ACTUATOR PARKING PRAKE	00.0 TIGHTENED CONNECTOR ON SURSE TANK COOLANT LEVEL PROSE ASSY. PART NO. 1596499 EPR FB-730	00.0 ADDED 1 GALLON TRANSMISSION OIL	00.0 REPLACE DEFECTIVE ENGINE CIL PRESSURE SENDER EPR F8-155,739	3	00.0 ADDED 3 GALLONS HYDRAULIC OIL	00.0 REPLACED MIPROR HOUNTING YOKE ON ROADSIDE REAR VIEW MIRROR. EPR F8-718,777	012202 NO.01 LIFE-662.6 MIRROR, HTG YOKE ROADSIDE OF COCKPIT
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	VENT ASSY, BREATHER, MYLE VENT ASSY, BREATHER, TRAN VENT ASSY, BREATHER, TRAN FILTER ELEMENT HYDRAULIC PACKING, PREFORMED (FOR A				1	E, REHOTE A	2 00.			SENDER, PRESSURE		-	10R, HTG YOK
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03/05/79 MAINTENA 0 A 1		09/0	11/0	PART	13/0	PART	13/0	17/0	17/0	PART	21/0	21.0	PART

21/02/78 2 1042 088.0 U C C A M N N 0000 00.0 00.1 1 00.0 ADDED 2 GALLONS ENGINE OIL

Merco	*11	783	567 (5-1	954.	824	749,831	966	666
H DT E IT N AN GE DESCRIPTION	00.1 1 00.0 ADDED 1 GALLON TRANSMISSION OIL 00.7 1 00.0 WELDED BROKEN SHAFT ON THE PINION PIVOT ASSEMBLY AND INSTALLED EPR F8-774	02.6 2 00.0 FIGHTEN MISCELLANEOUS LOOSE NUTS AND BOLTS EPR FB-783 00.3 1 00.0 REPLACED CAP IN DIRECTIONAL CONTROL VALVE EPR FB-798	CAP 0.6 1 REPLACE DEFECTIVE TUBF IN WINDSHIELD WIPER ASSY. EPR F9-567(S-1)	TUBE FOR MINDSHIELD WIPR 00.6 2 00.0 REHOVED ROLLOVER PROTECTION SYSTEM EPR FB-824.	00.6 1 00.0 REMOVED CANVAS CAB REMOVE CAB FRAME REMOVED MIRRORS AND BRACKETS EPR FB-824, 00.1 1 00.0 REPLACED HANDLE ON SEAT SUSPENSION AIR CONTROL ASSEMBLY. EPR FB-830	HANDLE, SEAT SUSPENSION CONTROL ASSEMBLY-OPERATOR SEAT 00.1 1 00.0 REPLACED HANDLE ON PARKING BRAKE HAND CONTROL VALVE EPR F8-749.831 HANDLE, HAND CONTROL VALVE, PARKING BRAKES, COCKPIT,	12.0 2 REMOVED, WELDED SKIN CRACK, AND REINSTALLED HYDRAULIC RESERVOIR. EPR	0.2 1 REINSTALLED ENGINE SIDE COVER ASSEMBLIES WITH NEW BOLTS AND WASHERS. EPR FB-999 Screw, Cap Washer, Flat
TEST , FAMECE1 TEST ITEM , 939 T S E E T Q A C G CO CH , MH A A C C M A M S R OL LO AO S U H H ' T F P NY OU NU K R S T KS	U C C A M N N 0000 00.0 00.1 00 U O O A M Y Y 2402 00.0 00.7 0	U C C A H N N 0000 00.0 02.3 0	GP=000012402 NO=01 LIFE=UNK CI U O O A G Y N 2202 0.6	GP=000012202 NO=01 LIFE=931.3 TI	S C C A M Y N 1806 00.0 00.1 0	GP= 011006 NO=D1 LIFE= UNK H S C C A M Y N 1201 00.0 00.1 0 GP= 011206 NO=01 LIFF= UNK H	A Y 2408 8.0	O C C A N N 1802 0.2 (  GP=000011802 NO=10 LIFF= SC  000011802 10 H
01/05/79 MAINICHANCE TASK LOG TE 3 OWN A T 4 H H OUD C A T 5 OWN C A T 6 OWD T S C	21/02/78 2 1042 088.0A U	24/02/78 2 1054 090.0	PARIS 656589 28/02/78 1 1059 91.1	PARTS 2549865 28/02/78 1 1060 092.0A S	01/03/78 1 01060 093.0	01/03/78 1 010 0 0 93.0 A 5 PAFTS AC-25079	19/04/78 01080 094.0 CRITICALITY FACTOR= 1.00	18/04/78 01080 094.0A U

mean	666		666		666	666		666	1000			1002		765,999		11-51 428	
DESCRIPTION	INSTALLED CLEVIS PIN. EPR FB-999		REPLACE BULB IN BLACKOUT STOP LIGHT.	ESENT	REINSTALLED BOLT IN BATTERY BOX BRACE EPR F8-999	REPLACE SAFETY PIN IN PINTLE HOOK. EPR F8-999		TIGHTENED FITTINGS AT ACCUMULATOR EPR	REPLACED LEFT AND RIGHT DOLLY WHEEL TIRES. EPR F8-1000		TIRE, DOLLY WHEEL	REPLACED PLANETARY COVER. EPR FB-1002		REPLACED DOLLY WHEEL HYDRAULIC GLOSE VALVE HANDLE, EPR F8-765,999	HANDLE, GLOBE VALVE	00.0 REPLACED REAR VIEW MIRRORS AND Brackets. Epr F0-824(S-1)	20K
5 H H G		PIN CLEVIS		LAHP INCANDESENT			PIN, COTTER				מסררג		COVER-PLANET		, 640		BOLT 9OLT BRACKET, MIRROR NUT
IWZ	0.1 1	2	-	1 4	2.1	1 1	3	3 1	0 1			0.3 1	ER-	3 1	POLE	01.3 1	BOLT 90LT BRACKE WASHER NUT
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03/05/79 MAINTEHA D A T	82/70/61	ART	19/04/18	TAN	19/04/78	19/04/78	PARTS 170	19/04/78	19/04/78	111	API	9/0	AR	19/04/78	PARTS UNK	09/05/78	PARTS
MACALA	-	4	-	a	-	-	•	-	-	3	0	-	4	-	•	0	4

wa a w	1075	230	232	162	1078		1-51262		230(5-2	81(5-1)	
H OT E 11T H AM GE DESCRIPTION	-		1 00.0 AN DPERATOR DAMAGED THE AIR MANIFOLD AND BOOKE AN AIR LINE, MITH THE GRADER AND BOOKE OF BOOKE NO. INFO. ON MANIFOLD OR LINES) - THE MANIFOLD WAS DISCONNECTED + STORED ON THE GRADER - THE DUST COVER MAS PUT OVER THE MANFOLD SECTION OF THE P.S THE MISP DOES NOT INCLUDE THE NEEDED HOSE ASSY EPR. FB-232	5 # 00.0 STEERING CYLINDER STEEL HYDR. LINE REPLACED BY A FLEXIBLE LINE EPR FB-231	6 2 00.0 COMPLETED 500 HOUR MAINTENANCE. EPR	VENT ASSY, ØREATHER, TRANSFER CASE VENT ASSY, ØREATHEP, AXLE FILTER ELEMENT, FL, POMER CLUSTER	0.5 1 0.0 REPLACED BROKEN AIR HANIFOLD FITTING AND RECONNECTED AIR LINE.EPR FB-2.32 (S-1)	FITTING, AIR HAINFOLD	*7 1 REINSTALLED AIR CYLINDER AND DISCONNECT LEVER FORK ASSV. STRAIGHTENED AND REINSTALLED DISCONNECT LEVER COVER. EPR FB-230 (S-2)	5 1 00.0 INSTALLED NEW SERVICE DISC BRAKE AND NEW BRAKE PADS EPR F8-81(S-1)	C BRAKE, SERVICE , GRAKE , BRAKE
TAZ	0.1 0.1		000.3	01.5 01.5	00.3 00.6	VEN	0.5 0.	71.2 FIT		6.00 5.00	UNK DISC UNK PAD, UNK PAD,
EH .94.0 CD CH OL LO NY OU T KS			0.00	00.00	00.0	1 LIFE=	0.0	LIFF =471.2		00.00	LIFE
FAMECE1 TEST 17 E T Q A C G C H A H S R H H T F P	S C C A M Y N 0000	Z :		1001HYY2406	0 0 A M Y N 0000	GP=000040801 NO=01 000041000 01 000041204 01	0 0 A M Y N 1208	GF=000041208 NO=	0 0 A M N N 0 0 0 0 1	U F O A C Y N 1202	CF=001041202 NO=01 000041202 01
03/05/19 HAINTENANCE TASK LOG TEST 0 S OHR A T S F A H DON C A / O T F OUD T S U H E T HRS N K	28/03/77 1 405.8 008.0 5	0.600	04/10/77 2 471.2 009.0A U	05/10/77 2 482.1 010.0 U	11/10/77 2 502.9 10.1 S	PARTS 569022-03 569022-03 AC43887	14/13/77 1 521.4 10.1A U	PARTS UNK	14/10/77 1 521.4 10.16 U	14/10/77 1 521.4 010.2 0	PARTS 5207052 99-06750 99-06751

waxo		1060	1164	1105			231(5-1)	265 (5-1)			328		2-2121562	353	
	NO I La la CCC	PERFORMED 50 MR. MAINTENAANCE PER LUBE 080Er 105204-12. EPR FB-1030	REPAIR MIRING CONNECTOR-PULLED LOOSE WHILE UNCOUPLING EPR F8-1104	00.0 REPLACED LEFT SEALED BEAM HEADLIGHT EPR F8-1105	LAMP, SEALED BEAM	NO. O REINFLATED LEFT FRONT TIRE ON GRADER HORK SECTION.	00.0 REMOVE TEMPORARY STEERING LINE HOSE . REPLACE WITH METAL STEERING LINE EPR F9-211 (5-1)	DB.B INSTALLED NEW DISC BRAKE ASSEMBLY ON GRADER W.S. REPLACED AIR HOSE FROM MANIFOLD TO POWER CLUSTER AND HTO. HOSE TO GRAKE EPR FB-28515-1)		BRAKE, SERVICE ASSY, MM	DO.O REMOVED DISK BRAKE ASSEMBLY (ITEM 6, FIG. 15 OF TH DEP 5- 204-34 + P) SERVICE BRAKE WOULD OVERHEAT AND SELECUTIL IT MAS ALLOWED TO COOL. EPR F9-329		SO. O DISCONNECT CRUSHED AIR MANIFOLD . CAP OFF LINES EPR F8-295(232-2)	00.0 REPLACED LUBRICATION FITTINS ON ROD END OF SIDE SHIFT CYLINDER (BOTTOM). ROD EYE MAS TURNED TO PLACE LUBE FITTING ON TOP SIDE, EPR FG-329	FITTING, LUBRICATION 1/8-28
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1651 1184 ,946 5 6 00 CH 5 8 00 00 7 8 00 00 1 9 00	2	0.3	13 0 0.5	99 00.0 00.2	CP=000040609 NO=01 LIFF=UNK	13 60.0 00.4	14 00.0 01.3	0.50 0.00 50		041202 NO=01 LIFF=045.1	92 86.0 99.5		5.00 0.00 30	67 00.0 00.5	GF=000042407 NO=01 LIFF=
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# 2000 F		22/10/77 2 502.7	22/10/77 2 502.7	7.528 5 77781755	1	25/10/77 1 607.9 017.0	26/19/77 2 627.7 9	27/19/77 1 631.1 019.0	-	PARTS 5207052 4F-448-67NS90-23	28/19/77 1 636.6 0	CRITICALITY FACTORS	28/10/77 2 638.6 020.04	29/13/77 1 542.7 621.0	¥0
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0 3/05/79 0 0 4 1 H ENANCE 0 1 4 H H H F F F F F F F F F F F F F F F F		22	22	22	2	55	35	27	CHILICALITY FACTORS	49	25	567	2	2	4

MAINTENANCE TASK LOG TEST , FAMECEI TEST ITFM , 940  S GMR A T S E T D D G CO CH MH M DT  A H DON C A J C C H A H S R CL LO AO E IT  T F OUD T S U H H ' T F P NY OU NU N AH  E T MRS N K R S T CR KS  E T MRS N K R S T KS	
29/13/77 1 642.7 021.0A U O O I M N 7435 00.0 00.5 00.5 1 00.0 REPLACED NUTS ON PIN ASSY PART NO. 5268434 FOR ROD END OF MOLD 90ARD SIDE SHFT CYLINDER. REPLACED PART NO. 630-12H NUT, PLAIN, HEXAGON PHOS, CTG, 3/4-10 UNG. EPR FB-330	
GP=000047435 NO=04 LIFE=UNK NUT SELF LOCKING, HEXAGON MOLD BOARD CURBSIDE	
29/10/77 1 642.7 021.08 U C C I M Y N 7435 00.0 00.5 00.5 1 00.0 WASHED SOIL AND ROCK DUT OF AREA 331 GUARD, UNIT OPERATIONAL EPR FB-331(100-1)	331 (100-1)
29/10/77 1 642.7 021.0C U O O A C Y N 1202 00.0 02.0 02.0 1 00.0 REINSTALLEO SERVICE DISC 9RAKE REPLACEO 320 9rake pad reconnected air lines epr FB-32015-1)	328(5-1)
31/13/77 1 650.8 022.0 S C C A M Y N 0474 0.3 0.5 2 REVERSEJ END BITS ON HOLDBOARD ASSY. 332	
31/10/77 1 650.8 22.0A U O O A M Y N 2406 .3 .3 1 REPLACED AIR MANIFOLD EARLIER REMOVED 295 (S-1)	29515-11
PARTS 2548234 GP= 041208 NO=01 LIFF=106.1 AIR MANIFOLO	
31/10/77 1 650.8 22.08 S C C A M Y N 0.5 1.0 2 REPLACED BOTTOM BITS ON MCLOBOARD ASSY. 333	333,334
FARTS 2545319 GP=000047435 NO=02 LIFE=194.1 BIT, END MS35465-3 0000047435 01 063.7 BIT, BOTTOM, LH MS35465-2 000007435 01 063.7 BIT, BOTTOM, RH MS35465-2 0000047435 01 063.7 BIT, BOTTOM, RH	
01/11/77 1 661.9 023.0 U O O A M T Y 2406 00.0 00.3 00.6 2 00.0 LOCK KEY ON HYDRAULIS MANIFOLD SHEARED 337 OFF. REPLACED ASSEMBLY. EPR FB-337	
PARTS 2549911 GP=000042406 NO=01 LIFF= HYDRAULIC MANIFOLD ASSEMBLY ROADSIDE BELOW GOCKPIT	
02/11/77 1 672.2 024.0 U O O I H Y Y 1000 08.0 06.5 01.0 2 00.2 REMOVED YOKE AND YOKE ASSY AND INSPECTED THREADS ON TIE ROD NO DAMAGE NOTED. MOTED. PARTS WERE CLEAMED AND REPLACED. CLARK SITE REP. SUGGESTED CAMBER BE SET AT 1.8 INCH. EPR. 9.338 NOTHING COULD BE DEFENHED ADOUT MOVEMENT IN PINS AND BUSHINGS. HAINTENANCE MANUALS DO NOT INCLUDE WEAR DATA.	

waan	34.3	387	395	396	191	66	1079	
H DT E IT N AM GE DESCRIPTION	1.0 2 PERFORMED 50 MR MAINTENANCE EPR FB-1077 00.3 1 00.0 REMOVED SERVICE BRAKE ASST EPR FB-343	GP=000041202 NO=01 LIFE=064.5 SERVICE BRAKE DISC AND COMPONENTS.  C C A M Y N 7435 00.0 00.5 01.5 3 00.0 REPLACE BOTH CUTTING EDGES FPR FB-387  GP=000047435 NO=01 LIFE=056.3 BIT, BOTTOM L. H.  000047435 01 056.3 BIT, BOTTOM R. H.	00.2 1 00.0 REPLACED BROKEN LUBRICATION FITTING ON THE TIE ROD END (ROADSIDE) EPR F8-395 FITTING LUBRICATION	C C A M Y N 7435 00.0 00.7 01.4 2 00.0 REPLACED L. H. + R. H. BOTTOM BITS EPR F3-396 GP=000047435 NO=01 LIFE=062.9 0IT-BOTTOM L. H. 000047435 01 062.9 BIT-BOTTOM R. H.	M Y N 0609 00.0 00.3 00.3 1 00.0 REPLACED CURSSIDE SERVICE LIGHT EPR FB-397 040609 NO=01 LIFE=772.5 LAMP, SERVICE LIGHT, CURBSIDE	00.5 1 00.0 REPLACED AIR MANIFOLD HANDLE WITH DETENT KEY NOTE! AIR MANIFOLD WAS REPLACED AT 655.8 ENGR. MRS. THE ENTIRE MANIFOLD ASSEMBLY WOULD MAVE BEEN REPLACED HAD ONE BEEN AVAILABLE. EPR FB-399	041208 NO=01 LIFE=136.6 AIR MANIFOLD HANDLE & LOCKING ASSY M Y N 0600 00.4 00.8 2 00.0 COMPLETED 250 HR. MAINT EFR F9-1079 040801 NO=01 LIFE=290.1 VENT ASSY, BREATHER, TRANSFER CASE 04,000 01 290.1 VENT ASSY, BREATHER, AXLE	290.1 FILTER ELEMENT, FL, POWER CLUSTER
1020		9 SER 01.		9 611	. LA.		AIR 00.	FIL
623328	0.00 0.00	LIFE=064.5 00.0 00.5 LIFE=056.3	C C A M Y M 1000 00.0 00.2 GP=000041000 NO=01 LIFE=UNK	00.0 00.7 LIFE=062.9	00.0 00.3	5.00 0.00	00.4 1FF=290.1 290.1	290.1
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1EST 17EM C G CO S R OL F P NY	S C C A M Y M 0000	C A M Y N 7435 C A M Y N 7435 000047435 NO=0	U C C A M Y N 1000	C C A M Y N 7435 GP=000047435 NO=0	C A M Y N 0609	и т т 1208	041208 NO=	
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	05/11/77 2 700.9 025.0 08/11/77 1 799.6 027.0 URITICALITY FACTOR= 1.00	PARTS 5207052 08/11/77 2 709.6 028.0 PARTS MS35465-3 MS35465-2	14/11/77 2 772.5 029.0 PARIS 10H-25	14/11/77 2 772.5 029.0A PARTS HS35465-3 HS35465-2	14/11/77 2 772.5 029.09 PARTS 4860	16/11/77 1 792.4 030.0	PARTS UNK 17/11/77 1 793.0 030.1 PARTS 569022-03 569022-03	AC43887
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					070		REINSTALLED. CONTROL R. BOARD EPR FB-655	EPR											,				-		v	00.1 APPLIED HEAT TO AIR MANIFOLD TO MELT ICE AND RESEAT THE MANIFOLD. EPR F9-575	EPR
					00.0 REPAIR DEFECTIVE HYDRAULIC MANIFOLD		CONT	01.0 REPAIRED TRANSFER CASE ASSEMBLY EPR																	00.3 ADJUSTED BOLT ON TOP OF HYDRAULIC HANIFOLD EPR F8-466	7 A	LY E
					I S		REINSTALLED. CON BOARD EPR FB-655	SEM											İ				1		YDR	010	00.0 REMOVED SERVICE BRAKE ASSEMBLY
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wa	αv	FT 513	R 513		343 (5-1)	520	521		525		34315-2)	537		536	R 522(S-1)	245 07
	TION	TO BALL JOINT TO SCARIFIER SHAFF	ED SCARIFIER HYDRAULIC CYLINDER		00.0 REINSTALLED DISC BRAKE ASSEMBLY AND HOUNTING BRACKETS EPR F8-34315-1)	00.0 REMOVED GLAD HAND FROM AIR RESERVOIR AND PLUGGED HOLE EPR FB-520	SCARIFIER BITS (REHOVED OLD R F8-521		00.0 REPLACED HOSE FROM AIR MANIFOLD FO HIDMOUNT AIR VALVE. EPR F8-522		O ADJUSTED CLEARANCE OF SERVICE BRAKE DISC PADS. EPR FB-343(S-2)	09-1 ADJUSTED PARKING GRAKE ASSEMBLY AND REPLACED LOCK NUT ON ASSEMBLY ADJUSTMENT BOLT. EPR F8-537		PERFORMED 50 HR MAINTENANCE PER LUBE 080ER LOS-3840-204-12. EPR FB-538	00.0 REINSTALLED COVER ON DISCONNECT LEVER EPR F9-522(5-1)	TO LOWER ADAPTER ON AIR MANIFOLD
101		00.0 REWELDED EPR F8-513	00.0 REPLACED EPR FB-513	CYLINDER ASSEMBLY	00.0 REINST	AND PLUGG	00.0 REPLACE SCARIF		00.0 REPLACE HIDHOUNT	HOSE ASSEMBLY	03.0 ADJUSTED DISC PADS.	09.1 ADJUSTE REPLACED ADJUSTMEN		DROER LOS	00.0 REINSTALLED C EPR F9-522(S-1)	00-1 REPLACED
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HECE1 TEST JTEM ,94. T Q A C G CO H A H S R OL		UFFACHN 7440 00.0 00.5	NUFOACHN 2487 00.0 01.3	GP=000042407 NO=01 LIFE=UNK	U O O A C Y N 1202 80.0 01.0	A U F O A C N N 1206 00.0 00.5	1 S O O A H Y N 7440 00.0 00.4	GP=000047440 NO=11 LIFE=912.7	UFOICYY1208 00.0 00.5	GP=008041208 NO=01 LIFE=UNK	UFFACYN1202 00.0 00.7	U O O A M Y Y 1201 . 00.6 . 00.2	GP=000041201 NO=01 LIFF= UNK	4 S O C A M Y N 8006 00.4	U O O A M Y M 08 01 00.0 00.3	U O O I M Y Y 1206 90.0 00.2
004	1 000 T T MRS T MRS T T MRS T MRS T T MRS	07/01/78 2 911.7 037.0	07/01/78 2 911.7 037.0A	PARTS 2545513	07/01/78 2 912.3 038.0	09/01/78 2 912.3 036.0A	09/01/78 2 912.7 039.04	PARTS 5238991	19/01/78 2 913.4 040.0	PARTS UNKNOWN	10/01/78 2 914.3 041.0	11/01/78 1 914.3 042.0	PARTS UNK	11/01/78 1 914.5 42.04	12/01/76 1 916.1 043.0	13/01/78 1 927.9 044.0

waxn	543		247		557 (5-1)	577 (5-2)		11-5) 225		622 (557-1		710		916	
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	00.0 REPLACED LEFT AND RIGHT HAND CUTTING EDGES EPR F8-543		R.H. BOTTOM		- REMOVED AND	8		00.0 REPLACED HYDRAULIC TUBE TO STEERING CYLINDER EPR F8-577 (S-1)		1		00.0 REMOVED AND INSTALLED NEW CUTTING EDGE ON HOLDBOARD. EPR F9-710	-	œ.	
	9				O WELD CRACK IN MOLD BOARD - REMO RE-INSTALL BOTH CUTTING EDGES EPR FB-557(5-1)	00.0 FABRICATED AND REPLACED U-BOLT SCARIFIER SHAWK EPR F8-577(S-2)		STE		8		110		PERFORMED 1000 HR MAINTENANCE PER ORDER LOS-3840-204-12. EPR FB-916	
	H A		•		0665	D FABRICATED AND REPLACED U-BOL SCARIFIER SHANK EPR F8-577 (S-2)		10		99.0 WELDED CRACK IN HOLDBOARD EPR		*		E K BY	
	CH1				OAR 6 E	CEO		11		190 A		10 N	1	EPI	FER CASE
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ž	.EFT		HORN S EP		N TO	AAHK		TYDR		X -		40 I		100	VENT ASSY, BREATHER, TRANS
DESCRIPTION	O REPLACED LEFT A		O REPLACED HORN OUT L.H. CUTTING BITS EPR FB-547		1 E &	ATE		O REPLACED HYDRAULIC TUB		O WELDED CRAC		O REMOVED AND INSTALLED ON MOLDBOARD. EPR F9-710		HE 0	- 4
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	171	2 2	1/10	5	7/10	11/1	13 2	1111	5 2	1/1	CAL	1120		1120	
34 F W	3/0	AR	191	AK	18/1	23/6	PAR	37.0	AR	311	11	190	46	8	PARTS

w a & w	2.0	176	766	77.	766	25	823	933
TEST , FAMECE1 TEST ITEM , 940  T S E E T Q A C G CO CH MH H DT  A / C C M A M S R OL LO AO E IT  S U H H ' T F P NY OU NU NA AH  K R S T CR R GE  DESCRIPTION	U C C A M Y N 74.35 00.0 00.3 00.6 2 00.0 REPLACED LEFT AND RIGHT HAND BOTTOM BITS EPR FB-74.0 GF=000047435 NO=01 LIFE=020.0 BIT, BOTTOM, LEFT HAND	000047435 01 020.0 GIT, BOTTOH, RIGHT HAND U O O A M Y Y 2406 00.0 00.7 02.1 3 00.0 REHOVF HYDRAULIC ELBOM FROM GRADER H.S.T950 AND INSTALL IN GRADER M.S.T940 EPR FB-776	U O O A M Y Y 2406 00.0 00.5 00.5 1 00.0 REMOVED HOSE ASSEMBLY AND REPLACED FITTING AND REINSTALLED HOSE ASSEMBLY. EPR FB-766	GP= 042406 NO=01 LIFE= UNK FITTING, HOSE NM HYDRA MANIFOLD U C C A H Y N 7436 00.0 00.2 00.2 1 00.1 TIGHTENED NUTS ON CAPSCREWS USED IN THE DRAMBAR WELDMENT BALL SOCKET. EPR F8-779	U O O A M Y N 2407 00.0 00.5 00.5 1 00.1 DRILL OUT DAMAGED LUBRICATION FITTING. Rethread hole and install new fitting. Epr F9-766	GP= 042407 NO=01 LIFE=UNK FITTING, LUBRICATION BLADE SIDE SHIFT CYLINDER S C C a h y n 7435 00.0 00.8 00.8 1 00.0 RFPLACE L. H. AND R. H. BOTTOH BITS EPR FB-773	GP=000047435 NO=01 LIFF=051.6 LH.BOTTOM BIT 000047435 01 051.6 R H BOTTOM BIT U O O A M N N 0424 00.0 00.1 00.1 1 00.0 REPLACED STUD IN CIRCLE SIDE SHIFT CYLINDER TRUNNION CAP. EPR FB-823	GP= 042407 NO=01 LIFE=UNK STUD, CIRCLE SIDE SHIFT CYLINDER TRUNNION CAP S O O A C N N 0801 00.0 00.1 00.1 1 000. INSTALLED RETROFIT KIT TO MANUALLY DISCONNECT MID MOUNT BEARING, 2 MASHERS, 1 NUT 1 PIECE OF TUBING EPR
N K C C C C C C C C C C C C C C C C C C	051.0 0 6			1		055.0 5 0		
NCE TASK L S OHR H DON T ARS	~	HS35465-2 18/02/78 2 01024	21/32/76 1 01035	PARTS 727-20-20 21/02/78 1 01035	21/02/78 1 01036	PARTS 4758J 22/02/77 2 01048	PARTS MS35465-3 MS35465-2 28/02/78 1 10f0	PARTS 2546417 02/03/78 2 010f0
03/05/79 MAINTENA 0 A T T	17/0 PART	18/0	21/3	21/0	21/0	PART 22/0	PART 28/0	DART 0270

10,703/79   10,7	mean	991	131,100		1004		1005		9001	y'	1001	
TEST, FRANCEL TEST ITEM ,940  T S E E T G G CD CD CD AO E IT  S U H H I T F P NY OU NU H AH  NS U H R S T 7436 0.6 1 FR  OU F F A Y 77436 0.6 0.6 1 FR  OU F F A Y 77436 0.6 0.6 1 FR  OU F F A Y 77436 0.6 0.6 1 BE  OU F F A Y 77436 0.6 0.6 1 BE  OU DOUGHOUS U O O I LIFF PACKET,  OU DOUGHOUS U D BEARING, BALL  OU DOUGHOUS U D BEARING  GP-BOUDGLOOW NO=DZ LIFF C CYLINDER ASSY, ACT  GP-BOUDGLOOW NO=DZ LIFF C CYLINDER ASSY, ACT  OU DOUGHOUS U D BEARING  OU DO A Y Y Z407 1.1 Z.2 Z  CYLINDER ASSY, ACT  GP-BOUDGLOOW NO=DZ LIFC CONE, BEARING  OU DO A Y Y Z407 1.1 Z.2 Z  CYLINDER ASSY, ACT  OU DOUGHOUS U D BEARING  OU D BE D BEA	NO 1.1	CRACK ON CIRCLE WELDMENT. EPR	EN AIR MANIFOLO 47 BRACKETS ON	11F0L0	1		AND REPLACED TWO BLADE LIFT . EPR F8-1005		AND REPLACED CIRCLE SIDE EPR F8-1006			
TEST, FRMECEL TEST ITEH ,94.0  T S E E T G A C G CD CH HH H D S R OL CH CH H H D S R OL CH CH R E I T CR R C C H H F D S U H H I T F R NY COU NUU NUU NA R S U H H I T Y 74.38 0.6 0.6 1  OB U F F A Y 74.38 0.6 0.6 1  OB U F F A Y 74.38 0.6 0.6 1  OB U F F A Y 724.38 0.6 0.6 1  OB U F F A Y 724.38 0.6 0.6 1  OB U F F A Y 724.07 1.0 1.0 1.0 1.0 1  OB U F F A Y 24.07 1.1 2.2 2  GP=00004.24.07 NO=02 LIFF= CYL ASSY,  OB U O D A Y 24.07 1.1 2.2 2  GP=00004.24.07 NO=02 LIFF= CYLINDER  GP=00004.1004 0.2 CIFF= CYLINDER  OB U O D A Y 24.07 1.1 2.2 2  GP=00004.1004 0.2 CIFF= CYLINDER  OB U O D A Y 24.07 1.1 2.2 2  GP=00004.1004 0.2 CIFF= CYLINDER  OB U O D A Y 24.07 1.1 2.2 2  GP=00004.1004 0.2 CIFF= CYLINDER  OB U O D A Y 24.07 1.1 2.2 2  GP=00004.1004 0.2 CIFF= CYLINDER		WELDED FB-991	REMOVED HYORAULI FRAME, EP	ET, HYD HAN	REMOVED BEARINGS, CASE, EPR	PREFORMED BALL, ANLR BALL, ANLR	REMOVED CYL INDERS	ACTG, LIN	CYLINDER.	ISSV.	REMOVED BEARINGS FB-1007	ING NG LING NG
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15/09/77 1 097.6 003.0	160	9.	3.0	5	•	0	4	o	-	Y 0708		0		9.1.9	03.6		MITH ELECTRICAL CIRCUITS ASSOCIATED MITH ELECTRIC CONTROL VALVE. CHECKED TRANSMISSION HYDRAULIC PRESSURE. DETERMINED NEUTRAL SOLENDID TO BE FAULTY REMOVED AND REPLACED FAULTY SOLENDID. ON MALE BODY OF CHARLE SOLENDID.	CIRCUITS ASSOCIATED ROL VALVE. CHECKED JLIC PRESSURE. SOLENDID TO BE SOLENDID TO BE REPLACED FAULTY OF IN VALVE BODY OF	151017-2
CRITICALITY FACTOR= 1.0	FAC	10R=	1.00														30LENGIO COOLO MAYE BEEN CAUSE OF HALFUNCIION. DEP-5-201-348P, 8-186, 78 EPR F8-141(17-2)	-348P, 8-186, FIG	
PARTS 236402	0.5			1	3	= d9	1	3	20	N 80	010708 NO=01 LIFE=	5	=3		SOLE	NOI	SOLENOID, NEUTRAL		
15/03/77 2 097.7 004.0	160	.7 00		n	C	S	•	=	z	0 2	0000	0.00		00.1	00.1	-	00.0 ANDED 1 GALLON OF OIL TO TRANSMISSION	L TO THE	
16/09/77 1 102.8 005.0	102		2.0	n	O	O	<	<b>T</b>	-	0 0 0 0						N	O CONDUCTED 50 HOUR MAINTENANCE ADDED APPROX. 150 ML TO POWER SECTION MASTER CYLINDER RESERVOIR CHECKED TACH: POSSIBLE FAULTY SENDING UNIT. EPR F8-1071	INTENANCE ADDED R SECTION MASTER CKED TACH;	1101
16/09/77 2 107.9 006.0	107	00 6	6.0	>	S	U	4	<b>T</b>	>	N 2202	20	0.00		2.00	00.5	-	00.0 TIGHTEN PANTOGRAPH RIVNUT ON MINDHIELD MIPER, MIPER MOULD NOT OPERATE, EPR FB-158	OPERATE. EPR	158
21/09/77 2 127.3 7.0 CHITICALITY FACTOR= 1.0	127 FAC	. 30	7.0	2	0	0	4		-	7 0106	90			1.6	3.5	~	REINSTALLED ALTERNATOR BELTS ON 19 SEPT. BELTS WOULD NOT STAY IN PLACE. REPLACED BELTS ON 21 SEPT. (1.0 HR K HEN) EPR FB-154	TOR BELTS ON 19 STAY IN PLACE. SEPT. (1.0 HR X2	154
PARTS 217695	96				3	0=	00	010	96	1 N	GF=000010631 NO=02 LIFE=	5			9E LT	₹	BELT, ALTERNATOR		

	w	BRAKE 1072	VES 191 EPR	171				PR 225	1014	LON	1113	1114	022	RING 401	
	UT III AM GE DESCRIPTION	DO.O 50 HOUR MAINTENANCE ADDED 300 ML BRAI FLUID TO RESERVOIR ADDED 175 HL OIL TO MIOMOUNT BEARING. EPR FB-1072	90.0 INSTALLED DOLLY WHEEL CUT-OFF VALVES INTO DOLLY WHEEL CYLINDER CIRCUIT. EPR F8-191	03.0 REPLACED HEAD LIGHT RELAY SERVICE HEADLIGHTS INOPERABLE-FOUND RELAY TO BE FAULTY EPR F8-171	RELAY, HEADLIGHT	DB.D ADDED 1 GALLON HYDRAULIC OIL	00-1 ADDED 1 GALLON HYDRAULIC OIL	00.0 ADDED 1 GALLON TRANSMISSION OIL EPR F8-225	50 HOUR MAINTENANCE. EPR FB-1074	00.0 ADDED 1 GALLON HYDRAULIC DIL ADDED 1 GALLON TRANSMISSION DIL ADDED 1 GALLON ENGINE DIL	ADJUSTED DOLLY WHEEL BEARINGS. EPR	CLEANED AIR TANK DUMP VALVE, EPR F8-1114	00.0 AOJUSTED PARKING BRAKE EPR F8-220	00.1 NSTALLED A REPAIR KIT IN THE STEERING CONTRJC VALVE REASON! STEERING VALVE MAS LEAKING OURING OPERATION EPR F9-401	
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H H DT O E IT U N AM R GE DESCRIPTION	00.2 1 00.1 STRAIGHTEN HAND RAIL REASON! HAND RAIL ON PASSENZER SIDE OF POWER UNIT BENT, OPERATOR HIT A TREE EPR FB-400	01.0 1 00.3 REPLACED PRESSURE SENDER OIL SENDING UNIT HAS 3ROKEN OFF EPR FB-402	PRESSURE SENDER 03.4 2 00.0 PERFORMED 250 HOUR MAINTENANCE. EPR FB-1032	FILTER ELEMENT, DIL, FULL FLOM FILTER ELEMENT, DIL, BYPASS CARTRIDGE, FUEL FILTER FILTER ELEMENT, DIL, TRANSHISSION FILTER ELEMENT, MATER, CORROSION RESIST FILTER ELEMENT, FL, POWER CLUSTER VENT ASSY, BREATHER, MONT VENT ASSY, BREATHER, AXLE VENT ASSY, BREATHER, TRANSHISSION	00.3 1 00.0 OIL LEAKING FROM HOSE ASSY AT PRESSURE SENSOR- ENG. OIL) RE-TIGHTEN THE FITTING ON THE HOSE EPR F8-229	00.5 1 00.0 ADJUST PARKING BRAKE EPR F8-1069	00.3 1 00.0 ADJUST PARKING BRAKE-OUT OF ADJUSTMENT EPR FB-234	00.3 1 00.0 ADDED 4 QUARTS OF OIL TO THE TRANSMISSION	00.2 1 00.0 INSTALL LAMP-IN LEFT SERVICE HEADLIGHT TO REPLACE BURNED OUT LAMP EPR F8-236	LAMP, SEAL BEAM	THE OF ITO BO STORING TO GOOD A GO P C. OR
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10	AM GE DESCRIPTION	100.3 THROTILE STUCK IN HIGH IOLE, ADJUSTED LINKAGE USING EXISTING JAM NUT. PROPER NORQUE ON THE NUT MILL HOLD THE ADMINISTRATES CHOILD		00.1 1 00.1 ADDED 3 QT TRANSHISSION OIL	00.1 ADDED 4 QTS OF TRANSMISSION FLUID	00.0 PERFORMED SO HR MAINTENANCE PER LUBE Order LOS-3840-201-12 EPR FB-405	00.0 INSTALLED CANVAS CAB ASSEMBLY. (TM DEP 5201-20+ P INADEQUATE- TH STATES THE PERTINENT CANVAS CAB ILLUSTRATIONS FIG 2-17C, PAGE 2-80C + FIGURE 132, PAGE C-172 SHALL BE SUPPLIED LATER.)	00.0 ADDED 4 QUARTS OF TRANSMISSION OIL	00.0 ADDED 2 QUARTS OF HYDRAULIC OIL	00.6 ORIVER COMPLAINED OF HARD STEERING-THE HECHANIC CHECKED THE STEERING OUT, SAID IT HAS OK + SENT THE DRIVER BACK TO TESTING. EPR F8-1070	00.0 ADD 1 GALLON OF TRANSMISSION OIL	CHECK + TIGHTEN HYDRAULIC LINES IN AND AROUND THE HYD. PUMP AREA. TRYING TO CORRECT A SHALL HYDRAULIC LEAK IN THE GENERAL AREA OF THE HYD. PUMP. EPR FB-1091	00.0 PERFORMED 50 HR HAINTENANCE PER LUBE 040ER L05-3840-201-12 EPR F9-408
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	DESCRIPTION	00.0 BROKEN GLAD HAND AT TUBE GOING INTO THE GLAD HAND. REMOVED TUBING AT UPPER CONNECTION AND CAPPED OFF, SERVICE SIDE EPR F9-409	88.0 INFLATED TWO TIRES TO 55 PSI FROM 48	GG.G ADDED 1 QT OF COOLANT TO THE RADIATOR.	00.0 REMOVE CURBSIDE MIRROR BECAUSE OF BROKEN MIRROR SUPPORT YOKE EPR F8-410	00.0 ADDED 6 QTS OF TRANSMISSION FLUID.	00.0 INFLATED BOTH DOLLY TIRES TO 90 PSI.	00.0 ADDED 2 GALS. OF HYDRAULIG FLUID.		MICHOUNT BEARING. EPR FB-444	00.0 ADDI GAL. OF TRANSMISSION OIL.	00.0 ADDED 1 GAL OF ENGINE OIL	DD.O TIGHTEN BRACKET HOUNTING BOLTS ON FLOODLIGHT EPR FB-415	00.0 ADDED 2 QUARTS OF OIL TO TRANSMISSION	00.0 PERFORMED 50 HR HAINTEMANCE PER LUBE 020ER LOS-3840-201-12. AUDED 1 PINT OF BRAKE FLUID TO THE MASTER CYLINDER. EPR FB-445
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H DT E IT N AM GE DESCRIPTION	00.1 1 00.0 ADDED 1 GAL OF TRANSMISSION FLUID TO THE TRANSMISSION 01.0 1 00.0 RED INDICATOR LAMPS WERE REPLACED ON THE CONVERTER TEMPERATIRE GAUGE, OIL PRESSURE GAUGE, AND MATER TEMPERATURE GAUGE. EPR F8-124,417	MARNING LAMP-LEFT HAND INSTRUMENT PANEL 00.2 1 00.0 ADDED 1 GAL OE-10 TO TRANSHISSION 00.2 1 00.0 ADDED 1 GALLON OE-10 TO TRANSHISSION	03.0 1 00.0 500 HOUR MAINTENANCE EPR FB-420 FILTER ELEMENT, DIL, FULL FLOW FILTER ELEMENT, DIL, BYPASS	GE, FUEL ELEMENT, ELEMENT, ELEMENT, SSY, BREAT SSY, BREAT	16.7 1 08.5 REPLACED 201, 30 GEAR SOLENGIOS 1. ELEGTRIC CONTROL VALVE. CHECKED FOR LOOSE WIRES (2/11) 5 HRX 1 HAN; GHECKED 1. REHOVED SOLENOIDS (3/11) 5.5 HR X 1 HAN; CHECKED SWITCH (4/11) 2 HR X 2 HEN; REPLACED SWITCH (4/11) 0.7 HR X 1 HAN. EPPA FB-421.	SOLENDIDS Switch, electric control
T , FAMECEL TEST ITEM , 94.1 E E T Q A C G CU CH MM C C M A M S R OL LO AO H H + T F P NY OU NU R S T K KS	C C A M N N 0000 00.0 00.1 0 0 0 0 0 0 0 0 0 0 0 0	GP=000010607 NO= LIFE=UNK C C A M Y N 0000 00.0 00.2 C C A M N 0000 00.0 00.2	6P=000010106 NO=02 LIFE=247.8	02 247.8 01 247.8 01 247.8 01 247.8	0 0 A H Y Y 0710 14.7	GP=000010710 NO=02 LIFE=UNK SC 000010608 01 UNK SI
03/05/79 MAINTENANCE TASK LOG TEST U S OHR A T S A H DON C A // T F OUD T S U	28/10/77 1 455.7 031.0A S 28/10/77 1 455.7 031.0B U	9ARTS 2547368 31/10/77 1 478.4 032.0 U 01/11/77 1 492.1 033.0 U	01/11/77 2 498.0 034.0 S PARTS HS-35802-3	5678 LF-511 299080 AC43887 569022-03 569022-03	04/11/77 1 501.4 035.0 U	CRITICALITY FACTOR= 1.00 PARTS 235402 2546583

04/11/77 2 509.4 056.0 U C C A M N N 0000 00.0 00.2 00.2 1 00.0 ADD 2 QUARTS OF OIL TO THE TRANSHISSION

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10		GE DESCRIPTION	00.1 ADDED 1/2 GALLON DE-10 OIL TO TRANSMISSION	00.0 ADDED 4 QUARTS OF OIL TO THE HYDRAULIC. TANK	00.0 ADDED 1 1/2 GALLON OE-10 TO TRANSMISSION	100.3 CHECK PRESSURE ON STEERING PUMP. INCREASE PRESSURE FROM 900 PSI TO 2500 PSI. THIS LOW PRESSURE WAS CAUSING HARD STEERING VARIABLE STEERING FUMP PRESSURE COMPENSATOR ADJUSTING TO 2500 PSI EPR FB-427	00.0 50 HOUR MAINTENANCE ADDED 3 02 BRAKE FLUID TO MASTER CYLINDER EPR FB-425	00.0 ADDED 9 HL OP LUBRICANT TO HIDHOUNT POWER SECT.	00.0 ADD 2 QUARTS OF TRANSMISSION OIL	00.0 ADDED 1 GAL OF TRANSHISSION FLUID TO THE WATER DISTRIBUTOR POWER SECTION DURING POST OPERATION INSPECTION.	00.0 ADDEO 1 GALLON DE-10 TO HYDAULIC RESERVOIR.	00.5 REPLACED SOLENOID ON ELECTRIC CONTROL VALVE EPR FB-479		GP=000010710 NO=01 LIFF= 90.1 SOLENOID, ELEC. ELECTRIC CONTROL VALVE	00.2 AUJUSTED VARIABLE STEER PUMP
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1 0 6 5 C R 1 P 1 1 O N	OD.5 SWITCH, CAB TURNAROUND, SWITCH WAS STUCK, VEMICLE WOULD NOT MOVE IN FWO OR REV. KNOCKED MUD AND DEBRIS OFF SWITCH ARM VEMICLE OPERATIONAL. DEP-5 201-201P PG G-74 FIG. 53 ITEM 28. DID NOT REPLACE. EPR FB-426	DO.O ADDED 1 GALLON DE-10 TO TRANSMISSION DO.O ADDED 1 GALLON DE-10 TO HYDPAULIC SYSTEM	50 HR HAINTENANCE ADDED 24 HL OF LUBRICANT TO P.S. MIDHOUNT. EPR F8-428	58.1 ADDED 1 CALLON DE-18 TO TRANSMISSION 3 IT fook 3 MEN 1.25 HRS. TO UNCOUPLE THE MODULES. EPR F8-429	00.0 ADDED 1 GALLON OF OIL TO ENGINE	00.0 ADDED 1 GALLON OF OIL TO TRANSHISSION 09.1 ADDED 1 GALLON OF OE-10 TO TRANSHISSION SINP	00.0 ADJUST 2 LOOSE ALTERNATOR BELTS EPR F0-430	00.0 REPLACE BROKEN PRESSURE SENDER EPR FB-431	PRESSUPE SENDER	00.0 ADDED 1 GALLON OF TRANSMISSION OIL	00.0 REPLACED MISSING DUST CAP ON AIR INTAKE CLEANER. EPR F8-432	OUST CAP ASST
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				DESCRIPTION	AND CONTRACTOR OF THE PROPERTY	00.0 COMPLETED 50 HOUR MAINTENANCE, EPR F8-1048	DO'O ADDED 1 GAL. OF TRANSH WE FLUID TO THE TRANSHISSION.	00.1 ADDED 1 GALLON OE-10 OIL TO FRANSMISSION SUMP.	00.1 ADDED 2 GALLONS DE-10 DIL TO HYDRAULIC RESERVOIR	00.0 REPLACED BROKEN ADJUSTING SCREW ON FAN HUB .8HR ADJ FAN BELTS .8HR TIGHTEN (2) CAP. SCREWS 1.4HR EPR F8-634		SCREW, ADJUSTING	DO.O ADDED 2 QUARTS OF ENGINE OIL	DO.O ADDED 2 QUARTS OF TRANSMISSION OIL	00.1 ADDED 1 GALLON OF OE-30 TO ENGINE	00.0 PERFORMED 250 HR. MAINTENANCE ADDED 32 QTS ENGINE OIL ADDED 11.2 ML OIL TO MIDHOUNT BEARING. EPR F8-436		FILTER ELEMENT, OIL, BYPASS		FILTER ELEMENT, WATER, CORROSION RESIST	VENT ASSY. BREATHER. HOMT	BREATHER, AXLE	1 REPLACED	
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. w a. a. v	OR. DID 733 HETER SSTITUTE	-	011	LUID.	.LUID.	11.	JIL LEAK. 590	.LUID.	UPPLY 438	ADDED 439	IVERTER 441	244		
DESCRIPTION	NOT CORRECT PROBLEM.REHOVED HOURHETER AND CAPACITOR.DID NOT CORRECT PROBLEM.REHOVED HOURHETER AND CAPACITOR AND INSTALLED A SUBSTITUTE HOURHETER WITH 4-50 VOLT OPERATING RANGE. EPR FB-733	DED 2 QUARTS TRANSMISSION OIL	DED 1 QUART OF TRANSMISSION OIL	ADDED 1 GAL. OF TRANSHISSION FLUID	DED 2 QTS. OF TRANSMISSION FLUID.	00.0 ADDED 1 GAL. OF TRANSHISSION OIL.	1.0 UNSUCCESSFULLY TRIED TO FIND OIL LEAK. EPR F8-590	00.0 ADDED 1 GAL. OF TRANSMISSION FLUID.	00.0 BRAZED HOLE IN AIR RESERVOIR SUPPLY Line Epr F8-438	00.0 PERFORMED 50 HOUR MAINTENANCE ADDED 33.6 ML OF OIL TO MIDMOUNT BEARING. E FB-439	01.5 CHECKED FLUID LEAKING FROM CONVERTER HOUSING DRAIN HOLE. LEAKAGE 6.03 OUNCES/HOUR. EPR FB-441	OISCONNECTED HORN. EPR F8-442	00.1 ADDED 1/2 GALLON 0E-30 TO ENGINE SUMP	
DT ITT GE OF	NOT AND RANGE	00.0 ADDED 2	00.0 ADDED	00.0 AC	00.0 ADDED 2	00.0 AC	1.0 UF	00.00 AC	00.0 BE	33.6 M FB-439	01.5 CH HOUS OUNC	0	00.1 AC	
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MAINIENANCE TASK LUG TEST JIEM +941  D S OHR A T S E E T Q A C G CD CH MH H OT  A H H ON C A / C C H A H S R OL LO AO E IT  T F OUD T S U H H T F P NY OU NU N AH  E T HRS N K R S T CR GE  KS R GE  DESCRIPTION	MCKN
U C C A H Y N 0000 00.0 00.2 00.2 1 00.0 ADDED 4 GALLON TRANSHISSI	
844.3 065.0 U C C A M Y N 0609 00.0 00.2	EPR 470
PARTS +880 GP=000010609 NO=01 LIFE=UNK LAMP SEAL BEAM RJADSIDE SERVICE HEAD LIGHT 20/12/77 1 844.3 055.0A U C C A M N N 0000 00.0 00.2 00.2 1 00.0 ADDED 1 GALLON TRANSMISSION FLUID (0E-10) TO SUMP	
21/12/77 1 850.4 065.1 U O 3 A M Y Y 0000 0.9 2.7 3 DIFFICULTY IN UNCOUPLING. EPR FB-1073	73 1073
21/12/77 1 850.4 065.1A U O O A M Y Y 0505 00.0 00.5 01.0 2 00.2 REPLACED LOST CAP SCREW FAN HUB ADJUSTING CLAMP EPR F8-487	184
PARTS 554316. GP=000010505 NO=01 LIFE=111.1 CAP SCREW FAN HUB	
21/12/77 1 850.4 065.18 S C C A M Y N 0000 0.3 0.9 3 50 HOUR SERVICE. EPR F8-484	101
21/12/77 1 852.2 066.04 S C C A M N N 0000 00.0 00.2 00.2 1 00.1 ADDED 1 GAL. 0E-10 TO TRANSMISSION SUMP	SUMP
21/12/77 2 852.2 067.0 S.C.C.Y M. M. 0000 00.0 00.1 00.1 1 00.0 ADDED 1 GAL. OF HYDRAULIC FLUID.	
05/31/78 2 059.3 069.0 U O O A M Y Y 0610 00.0 04.0 00.0 2 03.0 REPLACED FEMALE PIN CONNECTOR IN K6 RELAY TERMINAL BLOCK - ENGINE WOULD NOT START BY USING STARTER BUTTON EPR FB-500	500 0T
06/01/78 2 859.3 069.0A U F F A C Y Y 0302 00.0 01.5 03.0 2 00.0 REMOVED LEAKING FUEL PUMP (CRACKED HOUSING); ALSO REMOVED SURGE TANK, BRACKETS, LINES, AND HOSES TO REMOVE	516
PARTS 204161 GP=000010302 NO=01 LIFE=UNK PUMP, FUEL	
18/01/78 2 859.3 070.0 U F F A C Y N 0302 144. 10.6 14.4 2 00.0 REPLACED FUEL PUMP (PUMP NAS REPAIRED BY CUMMINS UNDER WARRANTY) REASSEMBLEO AND HOOKED UP ALL LINES- MUFFLER + SIDE PANELS EPR F8-516(S-1)	IRED 5161S- 1LED SIDE

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H DT E IT N AH GE DESCRIPTION	00.1 1 00.0 REPLACED DETERIORATED PACKING FOR A HOSE ASSEMBLY ON THE TANDEM PUMP EPR FB-642	00.1 ADDED 1 1/2 GALLON OF TRANSMISSION FLUID 00.0 ADDED 2.5 GALLONS OF HYDRAULIC OIL	HETAL TUBE ASSEMBLY CONNECTING TO THE PUMP, ADDED 16 GAL OF HYDRAULIC FLUID TO REPLENISH THE AMOUNT WHICH HAD LEAKEDFROM THE SYSTEM, EPR	IG PREFORMED 00.0 ADDED 2 GALLONS TRANSMISSION OIL	. 00.0 50 HOUR HAINTENANCE. EPR F8-1083	100.0 PREPARE VEHICLE FOR RAIL IMPACT TESTING. THE FOLLOWING ITEMS HAD TO BE REHOVED: WINDSHIELD ASSEMBLY, CAB FRAME AND CANVAS ROPS. EPR FB-737	00.0 REPLACE WINDSHIELD ASSEMBLY, CAB FRAME, CANVAS AND ROPS EPR FB-741	00.0 REPLACED SHIFT LEVER BALL AND ADAPTER EPR F8-808	SHIFT LEVER	00.0 INSTALLED LOWER HINGE PIN LOCK PLATE RETROFIT KIT EPR FB-832	
H O D &		00.2 1	01.4 2	PACKING 90.1 1	01.0 2	02.5 3	02.1 3	00.1 1	BALL, SI ADAPTER	1 7.10	
TEST , FAMECE1 TEST ITEM , 941  T S E T Q A C G CO CH M  A / C C H A H S R OL LO A  S U H H ' I F P NY OU N  K R S T CR	U O O A M Y Y 0708 00.0 00.1 GP=000010708 NO=01 LIFF=512.2	U C C A M N N 0000 00.0 00.2	U O O A M Y Y 2406 00.0 00.7	GP=000012406 NO=01 LIFE=UNK U C C A M Y N 0000 00.0 00.1	S C C A M Y N 0000 00.0 00.5	0 0 0 4 M N 00000 00.0 00.9	U C C A M N N 0000 00.0 00.7	U C C A H Y N 2402 00.0 00.1	GF=000012402 NO=01 LIFE=UNK 000012402 01 UNK	S 0 0 A C N N 1501 00.0 01.7	
HAINTENANCE TASK LOG TO SOHR A TO	02/02/78 2 868.1 071.0 PARTS 58K-219	03/02/78 1 878.6 072.0	03/02/78 2 879.8 073.08	PARTS 58K-219 09/02/78 2 903.3 074.0	09/02/78 2 908.6 074.1	14/02/78 2 916.0 075.0	17/02/78 2 916.0 076.0	27/02/78 1 917.1 077.0	PARTS 274 2546808	03/03/78 1 919.6 078.0	

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			DESCRIPTION		00.0 REDUCE PRESSURE TO DOLLY WHEEL CYLINDER AT RELIEF VALVE. FROM 2700 PS1 TO 2100 PS1 EPR F8-850	00.0 REHOVE ROPS SO VEHICLE COULD BE SI TO FORT BRAGG EPR F8-851	00.2 TIGHTENED DOLLY SHEEL RETAINING NUT AND REPLACED COTTER PIN EPR FB-862	8	00.0 ADDED 20 QUARTS OF HYDRAULIC DIL	00.0 ADJUST PARKING BRAKE CABLE EPR F3-878	REPLACED HORN PUSH SMITCH. EPR F8-1009		REPLACED PARKING BRAKE PAOS. EPR F8-1010	r., PAD.		CONVENIEN. EPR POSIDIL	ELLER	BATTERY CABLES REMOUNTED AND TIGHTENED. EPR FB-1012	TIGHTENED MUFFLER TO EXHAUST PIPE CLAMPS EPR FB-1012	REPLACE INSTRUMENT PANEL LAMP EPR FB-1012	
	¥ 0				02.0 1 00.	-	~	PIN, COTTER	1 00.	2	0.1 1	PUSH, SWITCH	0.0 1	HOLDER ASSY., PAD.	5 3		COVER, IMPELLER	1 1.0	1.1	.2 1	
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ITEH ,941		5 Z	-		0.00 7	0 00 0	0.00 7	GP=000011507 NO=01 LIFE=UNK	0.00 0	1 00.0	1	GF=000010607 NO=01 LIFE=	*	GP=000011201 NO=02 LIFE=			GP=000010708 NO=01 LIFE=	~			
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03/05/79 MAINTENANCE TASK LOG	SOHR	F 000	T MRS		08/03//8 2 919.6 079.0	08/03/78 2 919.6 079.0A	09/03/78 1 921.8 080.0	-508	09/03/78 2 921.9 081.0	14/03/78 2 922.0 082.0	24/03/76 929.2 083.0	63		90761	929.2	CRITICALITY FACTOR= 1	2660	929.2	2.626		
03/05/79 HAINTENAN			w	-	87/50/80	08/03/78	09/03/78	PARTS 1F-508	82/03/18	14/03/78	24/03/76	PARTS 9183	24/03/78	PARTS 1990761	24/03/78	RITICALI	PARTS 235660	24/03/18	82/50/42	24/03/78	

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				DESCRIPTION	REPLACED WATER TEMPERATURE WARNING LAMP EPR F8-1012	AH)	INSTALLED DRAIN PLUG IN BATTERY BOX EPR FB-1012	CLEANED PAINT OFF AIR RESTRICTION INDICATOR EPR F8-1012	TIGHTEN PACKING RETAINING NUT DOLLY WHEEL GLOJE VALVE EPR F8-1012	TIGHTEN SENDING UNIT EPR F8-1012	TIGHTEN FILLER TUBE FITTING EPR F8-1012	TIGHTEN HYDRAULIC HOSE CLAMP UNDER FENDER AIR CLEANER SIDE EPR F8-1012	COVER EPR F8-1012	DUMMY RECEPTACLE	FIGHTEN HYDRAULIC LINE FITTING AT ACCUMULATOR EPR F8-1012	STEUCIL "NO STEP" DOLLY WHEEL EPR F8-1012	STRAIGHTENED HOOD EPR F8-1012	TAPED AND REPOSITIONED BATTERY CABLE.	REPLACE PILOT LINE OUICK DISCONNECT PLUG EPR FB-1012
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Meso	409(5-1)		434 (S-1).		1012
DESCRIPTION	INSTALLED NEW TUBE ASSEMBLY TO THE SERVIJE GLAD HAND. EPR F8-409(S-1)	METAL	REPLACED ENGINE COOLING FAN. EPR		CLEANED AND SERVICED BATTERIES. EPR
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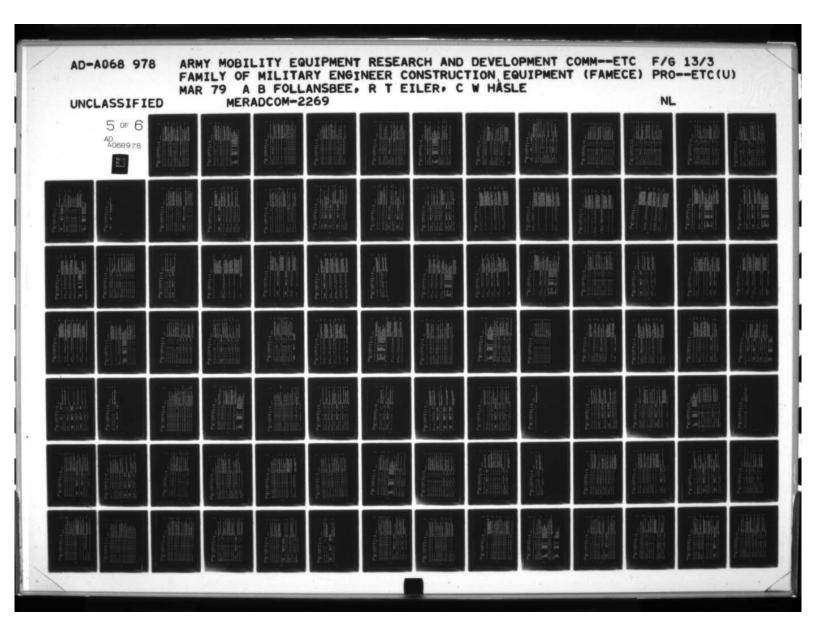
	w	<b>a</b> . o	e w	5. 559	PR 564	265 S		IDE 613		637	STAND 638	DY STAND	EPR 800	191		E 982	
			DESCRIPTION	00.0 COUPLED DUMPER TO POMER SECTION T-935. EPR F8-553 (TIME CHARGED TO P.S.)	00.0 REMOVED ROCK GUARDS ON BOTH WHEELS EPR	00.0 REPAIRED TAILGATE REPLACED OUICK Release pins with 1 inch bolts and nuts Epr f8-592	BOLT. 1 INCH X 6 INCH NUT. PLAIN 1 INCH	COMPOSITE LIGHT (TAILLIGHT LENS) EPR		00.0 ADDED 1/2 PINT BRAKE FLUID TO HATER CYLINDEP PERFORMED 50 HOUR SERVICE EPR F8-637	00.0 REPLACED CAPSCREWS IN THE LH BODY STA Support EPR F8-630	HEX HEAD 1/2-13 UNC 1 3/4 IN LG LH BODY	00.1 STRAIGHTENED CURBSIDE OF ROCK GUARD EP F8-800	00.0 REPLACE TAIL LIGHT AND DIRECTIONAL SIGNAL LAMPS EPR F8-797	INCANDESCENT	REPLACED QUICK RELEASE FINS TAIL GATE WITH BOLTS. DRILLED HOLES IN END OF BOLT AND INSTALLED COTTER PINS. REFER EPR FB-982 ITEM 1	C 2
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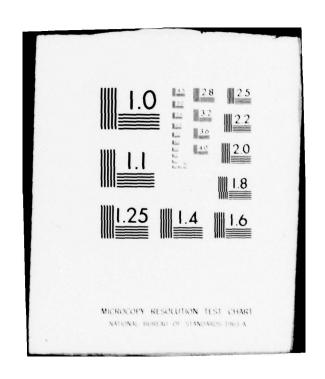
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						DESCRIPTION			0.3 0.3 1 0.2 RECONNECTED LIGHT WIRING TO STOP LIGHT 98	REPLACED SAFETY PIN ON RIGHT SHACKLE. REF EPR F3-982 ITEM 3	PIN COTTER
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w a &	v	238	1106	1081		1100	
H OT N AH	GE DESCRIPTION	01.6 1 00.8 REPLACE DEFECTIVE RELAY IN HEADLIGHT AND FLOODLIGHT CIRCUIT. EPR F8-238	01.4 Z 00.0 PERFORMED 50 HOUR MAINTENANCE. EPR FB-1106	01.4 2 00.0 PERFORMED 250 HR MAINTENANCE PER TUBE ORDER L05-202-12 REPLACED ALL OIL, FUEL, MATER, AND TRANSMISSION FILTERS ADDED 5 SQUIRTS FO OIL TO MIDHOUNT. CHECKED FLUID LEVELS IN PLANETARIES, TRANSMISSION HYDRAULIC TANK AND MASTER FB-1001	FILTER ELEMENT, OIL, FULL FLOW FILTER ELEMENT, OIL, BYPASS CARTRIOGE, FUEL FILTER FILTER ELEMENT, OIL, TRANSMISSION FILTER ELEMENT, MATER, CORROSION RESIST FILTER ELEMENT, FL, PONER, CLUSTER VENT ASSY, BREATHER, MONT VENT ASSY, BREATHER, AXLE VENT ASSY, BREATHER, TRANSMISSION	00.7 1 0.4 TIGHTEN ACCUMULATOR LINE, BECAUSE THERE HAS_A SHALL HYDRAULIC OIL LEAK.EPR FB-1100 00.4 2 00.0 INSTALLED CANVAS CAB ASSEMBLY. (THDEP 5-201-208P INADEQUATE- TH STATES THE PERTINENT CANVAS CAB ILLUSTRATIONS FIG	00.3 1 00.0 ADDED 4 QUARTS OF TRANSHISSION OIL
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maan	1084	300	301	304	1085	1011	304(S-	306
T H E DESCRIPTION 00.0 ADD 2 QUARTS OF OIL TO TRANSHISSION	8 E	ING 50 HR MAINTENANCE, REPLACED BULB BER MARKER LIGHT, BULB HAD BURNED REPLACEMENT BULB FUNCTIONED OK. 8-300	ACED BOLT ON THE ENGINE ACCESS LOCATED IN THE RIGHT REAR WHEEL THE BOLT WAS DISCOVERED HISSING THE PRE-OPERATIONAL CHECK. EPR	00.0 REMOVED LADDER ON AIR INTAKE CLEANER SIDE OF UNIT. MELO HAD BROKEN DURING BACK-FILLING OPERATIONS. INSPECTION SHOWED NO MELO PENETRETION. EPR F8-304	PERFORMED 50 HR. MAINTENANCE PER LUBE ORDER 605-3840-201-12. EPR FB-1085	HE PROPER	00.0 STRAIGHTENEO LADDER ASSY -WELDED TAB ON 3 LADDER MOUNT LADDER ASSY EPR FB-304(S-1)	DO.O INTERCHANGED MINDSMIELD MIPER CONTROL SMITCH, ON THE PASSENGER SIDE, MITHE THE WIPER CONTROL ON THE OPERATORS SIDE OF THE MINDSMIELD, EPR FB-306
OT III GE DES	PRESSU 40PSI.	IN AH OUT.	PANEL, PANEL, WELL. OURING	SIDE BACK-	PER	TENSI	00.0 STR LADOE FB-30	SWITC THE H
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T T T T T T T T T T T T T T T T T T T	00.0 ADJUST LOOSE ALTERNATOR BELTS EPR FB-307	POWER SECTION, VALVE UNSCREMED DURING PIT EXCAUATION. REINSTALLED SAME VALVE. EPR FB-308	00.0 REPLACED CURBSIDE SERVICE HEADLIGHT LAMP EPR F8-30515-1)	LAMP, SEAL BEAM, CURBSIDE HEAD LIGHT	00.0 50 HR MAINTENANCE MID HOUNT BEARING OK UNCOUPLING .4 HR. BRAKE RESERVOIR OK COUPLING .3 HR. EPR F8-1006	TIGHTENED FAN BELTS EPR FB-1102	00.0 ADDED 1 GALLON OF OIL TO THE TRANSMISSION	01.0 REPLACED NEUTRAL SOLENDID ON TRANSMISSION ELECTRIC CONTROL VALVE EPR		SOLENOTO_LOCATED ON ELECTRIC_CONTROL_VALVE_ROADSIDE_OF TRANS- HISSION.	00.0 ADDED 1 GALLON OE 30 TO ENGINE.	00.0 ADD 1 GALLON OF ENGINE OIL	00.0 RE-CONNECT BROKEN WIRE BACK TO THERMOSENDER EPR F8-311	00.0 ADDED 2 QTS OF TRANSMISSION OIL.	SCREW IN THE HYDRAULIC MANIFOLD EPR
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	The second of the second secon		DESCRIPTION	00.0 ADD 2 QUARTS OF OIL TO TRANSHISSION	50 HR HAINTENANCE ADDEO OIL TO HIDMOUNT BERAING ADDED BRAKE FLUID TO HASTER CYLINDER RESERVOIR EPR F8-1087	00.1 REHOVED TREADLE PIN REHOVED TREADLE, GLEANED ROCKS FROM UNDER FOCT TREADLE. EPR F8-314	FOOT TREADLE, THROTTLE VALVE COCKPIT FLOOR	DO.O ADDED 2 GALLONS OF OIL TO HYDRAULIC TANK	THE DOZER POWER SECTION DURING POST OPERATION INSPECTION.	00.1 ADDED 3 QUARTS OE-30 OIL TO ENGINE	00.0 ADDEO 2 QTS OF TRANSHISSION FLUID TO THE DDZER POWER SECTION DURING POST OPERATION INSPECTION.	00.0 500 HR. MAINTENANCE EPR F8-316	FILTER ELEMENT, OIL, FULL FLOW	CARTRIDGE, FUEL FILTER	FMENT, WATER, CORROSION RESIST	ENT.	HER.	BREATHER,	FILTER, SAFETY ELEMENT
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	IT	AH	DESCRIPTION	00.0 REPLACED TRANSMISSION PRESSURE SWITCH EPR F8-320	SMITCH, PRESSURE	00.0 ADDED 3 GAL. OIL TO FRANSPISSION. LOSS OF OIL WAS DUE TO BROKEN TRANSMISSION OIL PRESSURE SMITCH EPR FB-319	00-1 ADDED 1 GALLON DE-10 TO TRANSHISSION SUMP	00.0 UPPER FUEL TANK MOUNTING BRACKET FAILED AT THE WELD. REWELDED MOUNTING BRACKET TO THE POWER UNIT FRAME ASST. EPR FB-323	88.0 UPPER HTDRAULIC FLUID RESERVOIR MOUNTING BRACKET CRACKED PARTIALLY THROUGH THE MELD. REWELDED BRACKET. EPR FB-324	50 HR LJBRICATION PER LOS-3840-201-12 EPR F9-1088	00.3 ADJUSTED LINKAGE BETWEEN THROTILE Detent and air Cylinder. Epr F0-681	00.0 ADDED 2 QUARTS OF TRANSMISSION OIL	00.0 ADDED 1 QUART OF ENGINE OIL	00.0 ADDED 4 QUARTS OF TRANSHISSION OIL	80.0 PERFORMED SO HR. MAINTENANCE EPR F8-682	00.0 ADDED 1 QT. ENGINE OIL	00.0 ADDED 2 QUARTS OF TRANSMISSION OIL
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m a a n		53	53			26		3				9		
H OT E IT N AH GE DESCRIPTION	1 00.0 ADDED 1 GT. ENGINE OIL 1 00.0 ADDED 1 GAL. TRANSMISSION OIL	1 00.3 REMOVED PULL TYPE AIR CYLINDER AND CLEANED, REINSTALLED WITH DRAIN POINTING DOWN. EPR F8-532	1 00.2 REHOVED FUEL FILTER, REMOVED ICE AND FROZEN SEDIMENT, REINSTALLED. EPR F8-533	1 00.0 ADDED 1 GALLON OF TRANSMISSION OIL	1 00.0 ADDED 3 QUARTS OF TRANSMISSION DIL	1 00.2 APPLIED HEAT TO FROZEN AIR CYLINDER USED IN THROTTLE LOCK-OUT. TREADLE STUD MAS STUCK. EPR F9-568	1 00.0 ADDED 1 QT OF ENGINE OIL DURING PREOPERATION INSPECTION	1 00.0 REPLACE DEFECTIVE ELECT. CONTROL SMITCH EPR F9-684	SMITCH, ELECT. CONTROL	1 00.0 ADDED 2 QUARTS ENGINE OIL	1 00.0 ADDED 2 QUARTS HYDRAULIC FLUID	1 00.0 REPLACE DEFECTIVE RADIATOR CAP. EPR F0-469	RADIATOR CAP	1 00.1 ADDED 3 GALLONS GE-10 TO HYDRAULIC RESERVOIR
	00.1 1	01.0 1	1 9.00	1 2.00	1 2.00	00.6 1	1 1.00	6.00	HIT	1 1.00	1 1.00	1 1.00	ADI	1 2.00
H .94.3 CH CH AN L CO AO Y COR R KS	00.0 00.1	00.0 01.0	8.00 0.00	2.00 0.00	5.00 0.00	9.00 0.00	00.0 00.1	6.00 0.00		00.0 00.1	00.0 00.1	00.0 00.1		2.00
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MAINTENANCE TASK LOG S OHR A A H DUN C T F OUD T	06/12/77 1 625.4 041.0 06/12/77 1 625.4 041.0A	08/12/77 1 642.4 041.1	08/12/77 1 642.4 041.1A U	08/12/77 2 647.9 042.0	09/12/77 2 659.9 043.0	10/12/77 1 650.3 844.0	10/12/77 1 661.4 045.0	12/12/77 2 664.0 046.0	PARTS 25465PL	14/12/77 1 683.6 047.0	14/12/77 1 583.8 047.0A	15/12/77 2 686.7 048.0	PARTS 2549314	16/12/77 1 608.5 049.0

16/12/77 1 688-5 949-08 U C C A H H N D000 00-3 00-1 1 00-6 E IT F D N C C C A H H N D000 00-3 00-1 1 00-6 E IT F D N C C C A H H N D000 00-3 00-2 1 00-1 1 00-6 E IT F D N C C A H H N D000 00-0 00-3 00-1 1 00-0 E IT F D N C C A H H N D000 00-0 00-3 00-1 1 00-0 D C C D N D N D N D I I I I I I I I I I I I I	waxn	.53	564	536	506	818
06	11 H 3	1	', SEAL BEAM 1 00.0 ADDED 2 QUARTS ENGINE DIL 1 00.0 ADDED 3 GALLONS TRANSMISSION OIL 1 07.4 REPLACED TANDEM PUMP AND GASKET EPR	FINDER PUMP 1 100.2 REPLACED HOSE ASSEMBLY, TRANSMISSION 1 LOCKUP EPR F8-536	REAR ROADSIDE OF TRANSHISSION LOCKUP O MODULATOR VALVERAR ROADSIDE OF TRANSHISSION  1 00.0 ADDED 3.5 GALS OF TRANSHISSION OIL.  1 00.5 REPAIRED IMPROPERLY INSTALLED ROPS  1 00.0 ADDED 1 GAL ENGINE OIL.  1 00.0 ADDED 1 GAL. OF TRANSHISSION OIL.	1 00.1 ADDED 3 GTS OE-10 TO TRANSMISSION SUMP 1 00.0 REPLACED LOWER MIPROR HTG ARM ASSY. CURBSIDE EPR FB-515 OR MTG ARM ASSY CURBSIDE, COCKPIT.
06 TEST , FAHECEI TEST 11EH ,943  A 7 C C H A H S P OL CH  S U H H ' T F P NY OU  049.04 U C C A H N H 0000 00.0 00.2  050.0 U C C A H N H 0000 00.0 00.3  6P-800010609 NO=91 LIFE=  051.08 U C C A H N H 0000 00.0 00.1  1.00  6P-800012401 NO=01 LIFE=UNK  052.0 U F O A C Y Y 2401 00.0 00.1  653.0 U C C A H N H 0000 00.0 00.1  054.0 U C O A H N H 0000 00.0 00.1  055.0 U F O A C Y T 0721 00.0 01.4  055.0 U C C A H N H 0000 00.0 00.1  055.0 U C C A H N H 0000 00.0 00.1  055.0 U C C A H N H 0000 00.0 00.1  055.0 U C C A H N H 0000 00.0 00.1  055.0 U C C A H N H 0000 00.0 00.1  055.0 U C C A H N H 0000 00.0 00.1  055.0 U C C A H N H 0000 00.0 00.1  055.0 U C C A H N H 0000 00.0 00.1  055.0 U C C A H N H 0000 00.0 00.1	IODa	99.3	00.1 00.1 26.8	GAOK 01.4	00.1 00.1 00.1	
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		DESCRIPTION	00.1 REPLACED PINS . COTTER KEY THROTTLE LOCK OUT BELL CRAMK ASSENBLY EPR FB-516	PIN, STRAIGHT HEAD 3/8 INDIA, 1 1/16 IN LG PIN, COTTER UNDER COCKPIT AT ACCELERATOR	00.0 ADDED 3 GALLONS TRANSMISSION DIL	00.0 PERFORMED 250 HOUR MAINTENANCE EPR F8-558			NI, OIL, TRANSMISSION			BREATHER, TRANSMISSION	07.8 2 00.0 REPLACED BALL SOCKET ON THROTTLE LINKAGE EPR F9-574	(8.1)	00.2 1 00.0 RETIGHTENED LOOSE HOUNTING SCREWS ON FAN RING EPR F8-593	00.1 RECONNECTED WIRE TO COOLANT PROBE ASSEMBLY EPR F8-605(311-1)	00.0 REPLACED SEAL KIT IN STEERING CONTROL VALVE EPR F0-604		
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			7	1	9		1					-	SCREW, CAP, HEX, HEAD 1/2-13, 1 1/4 Hasher,Lock 1/2 ID, 15/16 un od Hinge Pin, Coupler Frame and Frame	¥ 5.0	
			00.0 REPLACED HORN SOLENOID EPA FB-297(5-1)		2 REPLACED SERVICE HOSE COUPLFR REMOVED AND STRAIGHTENED AIRLINE, REINSTALLED SAME PART 2547946 REMOVED AND MELDED AIR RES HIC BRACKET AND REINSTALLED PART 205267 EPR F8-643.		er			1	œ	00.0 REPLACED CAPSCREW AND LOCK WASHER IN THE LOWER HINGE LOCK PLATE EPR F9-546	UPL	O REPAIR AS A RESULT OF ACCIDENT REHOVE FUEL TANK REHOVE BROKEN BRACKETS HAKE NEW BRACKETS + WELD ON TANK AND REYOUNT TANK. INSTALL NEW ELBOW AIR RESERVOIR, THO C?! EACH HET TUBE ASSEMBLIES AND HOSE SERVICE COUPLING STRATCHTEN OUT ENGINE SIDE PANELS EPR F8-714 (5-1)	
			2-5		2 REPLACED SERVICE HOSE COUPLER REHOS AND STRAIGHTENED AIRLINE, REINSTALLEI SAME PART 2547946 REMOVED AND MELDED AIR RES MTC BRACKET AND REINSTALLED PART 205267 EPR F8-643.		00.1 REPLACED PREFORMED PACKING IN AIR CYLINDER EPR F8-627		110	316	00.0 PERFORMED 50 HOUR NAINTENANCE EPR F8-619	FB.	2	D REPAIR AS A RESULT OF ACCIDENT REN FUEL TANK REMOVE BROKEN BRACKETS MAK NEW BRACKETS + WELD ON TANK AND REMO TANK, INSTALL WEW ELDOW AIR RESERVOIT TANC (?) EACH METAL TUBE ASSEMBLIES A HOSE SERVICE COUPLING STRAIGHTEM UTI ENGINE SIDE PANELS EPR F8-714 (5-1)	
		=	-	1	STOR		=		00.0 ADDED 2 QUARTS TRANSMISSION OIL	DO. O ADDED I GALLON TRANSHISSION OIL	MC	* a	ž.	O REPAIR AS A RESULT OF ACCIDENT FUEL TANK REHOVE BROKEN BRACKETS NEW BRACKETS + WELD ON TANK AND R TANK. INSTALL NEW ELBOW AIR RESET TANK. INSTALL METAL TUBE ASSEMPLE HOSE SERVICE COUPLING STRAIGHTENE ENGINE SIDE PANELS EPR FB-714 IS-	
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	06.9	AD	SE	=	2 REPLACED SERVICE HOSE AND STRAIGHTENED ALPLIN SAME PART 2547946 REHOV AIR RES HIC BRACKET AND PART 205267 EPR F8-643.	S	1 REPLACED PREFORME CYLINDER EPR F8-627	08	ADC	AD	0 PERF	E L	EX.	O REPAIR AS A RESULT OF FUEL TANK REHOVE BROKEN NEW BRACKETS + WELD ON T TANK. INSTALL NEW ELBON TWO (?) EAGH WEALL USE HOSE SEPVICE COUPLING S ENGINE SIDE PANELS EPR F	
		00.0 ADDED 2 QUARTS OF EMSINE CIL		HON	OO.2 REPLACED SERVICE HOSE AND STRAIGHTENED AIRLINE SAME PART 2547946 REMOVE AIR RES MYC BRACKET AND PART 205267 EPR F8-643.	58	- 5	3	•	0		0.	***	FUEL TANK REMOVE BROKEN NEW BRACKETS + WELD ON 1 TANK. INSTALL NEW ELBON THO (2) EACH HETAL TUBE HOSE SERVICE COUPLING SI	010
101	SE A	6		SOLENOID. HORM	8	MOSE COUPLER, SERVICE AIR RESERVOIR	8	PACKING, PREFORMED	0	00	8	6	SCREW, CAP, HEX, HEAD 1/2-13, 1 1/4 Hasher,Lock 1/2 ID, 15/16 UN OD HIM And Frame	6	ER
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*	W. METAL  MOSE SERVICE  88.2 RECONNECTED LOOSE CONMECTOR ON  IRANSMISSION MIRING MARNESS, REPLACED 2  ELECTRICAL SUPPRESSORS, EPR F8-811	SUPPRESSOR, ELECTRICAL TRANSMISSION SOLENDIDS 01.0 2 00.0 REMOVED ROPS, CANVAS AND CAB FRAME EP? FB-063	66.0 ADJUSTED DOLLY WHEEL CYLINDER PRESSURE EFR FB-894 88.0 REPLACED WARWING DECAL ON PWR SECT. EPR F8-912	IG, POMER SECTION REPLACED TANDEM HYDRAULIC PUMP EPR 1-940	REPLACED CASKET ON REAR OF TRANSHISSION Sembly. EPR F8-941	REPLACED AIR CLEAMER ELEMENT EPR F8-942 T air, duter	ENT, AIR, INNER REPLACED TRANSMISSION DIRECTIONAL COMTROL MANDLE, EPR FB-942 . CONTROL W/HANDLE
DESCRIPTION	TUBE ASSY, METAL COUPLING, MOSE SERVICE 00.7 2 00.2 RECONNECT IRANSHISSIO ELECTRICAL	IN. ELECTRICAL	18.0 REPLACED FB-912	DECAL, MARNING, POMER SECTION 26.8 3 REPLACED TANDEM F8-948	N N	6ASKET  2 0.2 1 REPLACED AIR 328 FILTER ELEMENT AIR, DUTER	328 FILTER ELEMENT, AIR, INNER 1.0 1.0 1 CONTROL HANDLE, EP 170 SWITCH ELEC. CONTROL W/HANDLE
IN I	COUPLING, HOSE SE COUPLING, HOSE SE 00.7 2 00.2 REC IRANS	SUPPRESSO	00.5 1 0	DECAL. WA	248 PUMP TANDEM.	GASKET 0.2 1 FILTER EL	1.8 1 1.8 1 MITCH EL
22222 1422 1423	UNK C				•	•	
7EST 17EH .94.	01 01	GP# 00010613 NO#02 LIFE# UNK 0 3 A M M 1601 00.0 00.9	H N N 2407 DB.O 06.5	NO=01 LIFE= UNK F F 2401 9.1	GF=000012401 NO=01 LIFE= F F A M V V 0710	GF=000010710 NO=01 LIFE= C C A Y N 0304 GP=000010304 NO=01 LIFE=	0 0 A T H 6606 GP=009010608 NO=01 LIFE=
TEST . FAMEGELS OF THE CELL S C C C C C C C C C C C C C C C C C C	0	CP= 0001	72.6 U C C P H	# 0 0 0 n	5	5	5
03/05/79 MAINTENANCE TASK LOG 0 S GHR A A H DON C T F OUD T E T HRS N	2547946 7007-67 02/33/78 1 822.7 069.0	DAKTS 25-4959	14/03/78 1 825.1 71	DARTS 1511711 09/04/78 834.6 073.0 CRITICALITY FACTOR= 1.00	PARIS S230-19(552151) 08/0./78 1 834.6 073.0A CRITICALITY FACTOR= 1.00	PARTS 231781 03/04/78 834.6 073.08 PARTS P11-7437	PAKTS 2546564

m r & w	3.5	345	34.2	345	246		246	246		2*6	246	246	345	246	345	
DESCRIPTION	CLEAMED AND SERV BATTERY BOX Batteries epr FB-942	TICHTENED CABLE LEAD CONNECTION ON MASTER SMITCH EPR F8-942	TIGHTENED AIR LINE CLAMP BOLT EPR	REHOUNTED EXHAUST PIPE AND TIGHTENED CLAMPS. EPR F9-942	REPLACE CRANKCASE BREATHER EPR FB-942	BREATHER CRANKGASE	TIGHTEN TRANSMISSION OUTPUT SHAFT HOUSING MOUNTING BOLTS. EPR F8-942	REPLACED TRANSHISSION CONTROL WIRING HARNESS RETAINING STRAPS. EPR F8-942		TIGHTEN HICHOUNT PROPELLER SHAFT BOLTS. EPR F8-942	TIGHTEH LOCK NUTS ON TRANSMISSION DISCONNECT ROD. EPR F8-942	TIGHTENEO TRANSHISSION DIPSTICK TUBE SUPPORT CLAMP, EPR FB-942	TICHTEN FITTING ON HYDRAULIC LINE AT DOLLY WHEEL CYLINDER. EPR F8-942	TIGHTEN DOLLY WHEEL CONTRGL LEVER JAM Nut. EPR F8-942	INSTALL QUICK DISCONNECT CAP ON HYDRAULIC LINE. EPR F8-942	
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			DESCRIPTION	TIGHTEM HYDRAULIC LINE FITTING AT COUPLER LOCK EPR F8-942	REPLACED WINDSHIELD WIPER CONTROL VALVE	VALVE PARKING PRESS.	16.0 TROUBLESHOOTED TRANSMISSION ELECTRICAL MIRING-TRANSMISSION FAILED TO SHIFF	מינונייי שנני ניא יפישוי	HIRING HARM. XHSH	COUPLED TO SCRAPER MORK SECTION 1-948 AT LIFE PERIOD 721.0 HRS EPR F8-1121	PERFORMED SO HR SERVICE. EPR F9-1122	REPLACED DEFECTIVE 1ST GEAR SOLENDID.		REPLACED PREFORMED PACKING AT TANDEM PUMP, EPR F8-1125	PACKING, PREFORMED	ADDED 1 GAL ENGINE OIL	ADDED 16 GALS HYDRAULIC OIL BECAUSE OF MAJOR LEAK	0.1 REPLACED HYDRAULIC LINE. EPR F9-1127	HOSE ASSY,NM 56.50,242R4-JSN4-J905L4	ADDED 6 OTS HYDRAULIC OIL
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m <b>6</b> 6	0	TER. EPR F8-1129 1129			ERVICE. EPR 09-1132 1132		132	132	25.1	132	NG HITH	PR ₹8-1132	NG HITH	NG MITH  44.  ON PIPE  OF PER  HAIN	NG WITH  ON PIPE BETWEEN  HAIN  6	NG MITH NG MITH ON PIPE ON PIPE OF THEEN ON THE THO	NG MITH  NG MITH  ON PIPE BETWEEN  NA I THE THO  T AT THE THO  SN4-J905L4	ON PIPE BETWEEN STREEN T AT THE TWO SN4-J90SL4 ODEO. EPR
	ESCRIPTION	REPLACEO FUEL FILTER. EPR F8-1129			PERFORMED 50 HR SERVICE. EPR 84-1132	PERFORMED 50 HR SERVICE. EPI Added 2 ots engine oil	PERFORMED 50 HR SERVICE. EPR 19-1 ADDED 2 QTS ENGINE OIL 0.2 REPLACED BEARING IN STEERING WITH RETROFIT. EPR F8-1135	ERFORMED 50 HR SERVICE. EPI DOED 2 OTS ENGINE OIL EPLACED BEARING IN STEERIN ROFII. EPR FB-1135 ING ASSY	PERFORMED SO HR SERVICE. EPR ADDED 2 OTS ENGINE OIL REPLACED BEARING IN STEERING TROFIT. EPR F8-1135 RING ASSY ADDED 3.5 GAL HYDRAULIC OIL	PERFORMED 50 HR SERVICE. EPR ADDED 2 OTS ENGINE OIL REPLACED BEARING IN STEERING TROFIT. EPR F8-1135 RING ASSY ADDED 3.5 GAL HYDRAULIC OIL REPLACED O RING. EPR F8-1144	C Y 1410 NO=01 LIFF= FILTER, FUEL  C Y 1410 0.2 1 A00E0 2 OTS ENGINE OIL  C Y 1410 0.2 1.0 1 0.2 REPLACED BEARING IN STEERING  OI1410 NO=01 LIFF= GEARING, STEFRING ASSY  C N N 0000 0.2 0.2 1 A00E0 3.5 GAL HYDRAULIC OIL  C Y Y 2406 3.0 4.4. 2 REPLACEO ORING, EPR FB-1144  012406 NO=01 LIFF= 1144 PACKING, PREFORMED 1-5/16 ID, 1-9/16 OC	PERFORMED SO HR SERVICE. EPRADDED 2 OTS ENGINE OIL REPLACED BEARING IN STEERING TROFIT. EPR FB-1135 RING ASSY ADDED 3.5 GAL HYDRAULIC OIL REPLACED O RING. EPR FB-1144 ORHED 1-5/16 ID. 1-9/16 OC	PERFORMED SO HR SERVICE. EPRADDED 2 OTS ENGINE OIL REPLACED BEARING IN STEERING TROFIT. EPR FB-1135 RING ASSY ADDED 3.5 GAL HYDRAULIC OIL REPLACED O RING. EPR FB-1144 ORHED 1-5/16 ID, 1-9/16 OC ADDED 9 QTS HYDRAULIC OIL	PERFORMED 50 HR SERVICE. EPR 79-11  ADDED 2 GTS ENGINE OIL  D.2 REPLACED BEARING IN STEERING WITH RETROFIT. EPR FB-1135  STEERING ASSY  ADDED 3.5 GAL HYDRAULIC OIL REPLACED O RING. EPR FB-1144  PREFORMED 1-5/16 ID, 1-9/16 OC  ADDED 9 GTS HYDRAULIC OIL  ADDED 2 GTS ENGINE OIL  O.1 REPLACED PREFORMED PACKING ON PIPE CONNECTION TO TUBE ASSY AND BETWEEN TUBE ASSY AND RELIEF VALVE, MAIN HYDRAULIC SYSTEM. EPR FB-1146	ERFORMED 50 HR SERVICE. EPRODED 2 OTS ENGINE OIL EPLACED BEARING IN STEERING ROFII. EPR FB-1135 ING ASSY DOED 3.5 GAL HYDRAULIC OIL EPLACED O RING. EPR FB-1144 RHED 1-5/16 ID, 1-9/16 OC DOED 9 QTS HYDRAULIC OIL EPLACED PREFORMED PACKING ( RECTION TO TUBE ASSY AND DIE E ASSY AND RELIEF VALVE, MI E RAULIC SYSTEM. EPR FB-1146 RAULIC SYSTEM. EPR FB-1146	PERFORMED 50 HR SERVICE. EPR 79-1132  ADDED 2 GTS ENGINE GIL  D.2 REPLACED BEARING IN STEERING MITH  RETROFIT. EPR FB-1135  STEERING ASSY  ADDED 3.5 GAL HYDRAULIC GIL  REPLACEO O RING. EPR FB-1144  ADDED 2 GTS HYDRAULIC GIL  ADDED 2 GTS ENGINE GIL  ADDED 2 GTS ENGINE GIL  O.1 REPLACED PREFORMED PACKING ON PIPE CONNECTION TO TUBE ASSY AND BETWEEN TUBE ASSY AND RELIEF VALVE, MAIN HYDRAULIC SYSTEM. EPR FB-1146  PACKING  0.1 REPLACED ELBOW ON HOSE ASSY AT THE TWO  MAY VALVE. EPR FB-1146	FILTER, FUEL  2.4 3 PERFORMED SO HR SERVICE. EPR 79-1132  0.2 1 AODEO 2 GTS ENGINE OIL  1.0 1 0.2 REPLACED BEARING IN STEERING MITH  BEARING, STEERING ASSY  0.2 1 AODEO 3.5 GAL HYDRAULIC GIL  4.4 2 REPLACED O RING. EPR F8-1144  PACKING, PREFORMED 1-5/16 ID, 1-9/16 OC  0.2 1 AODEO 9 GTS HYDRAULIC OIL  0.2 1 AODEO 9 GTS HYDRAULIC OIL  2.4 2 0.1 REPLACED PREFORMED PACKING ON PIPE  CONNECTION TO TUBE ASSY AND DETWEEN  TUBE ASSY AND RELIEF VALVE, MAIN  HYDRAULIC SYSTEM. EPR F8-1146  0.3 1 0.1 REPLACED ELBOW ON HOSE ASSY AT THE TIMAY VALVE. EPR F8-1146	ADDED 2 OTS ENGINE OIL  REPLACED BEARING IN STEERING WITH ITROFIT. EPR FB-1135  RING ASSY  ADDED 3.5 GAL HYDRAULIC OIL  REPLACED O RING. EPR FB-1144  ORHED 1-5/16 ID. 1-9/16 OC  ADDED 9 QTS HYDRAULIC OIL  ADDED 9 QTS HYDRAULIC OIL  REPLACED PREFORMED PACKING ON PIPE DNNECTION TO TUBE ASSY AND BETWEEN HAE ASSY AND RELIEF VALVE, HAIN ORAULIC SYSTEM. EPR FB-1146  XING  REPLACED ELBON ON HOSE ASSY AT THE IY VALVE. EPR FB-1146  ON HOSE ASSY 56.50.242R4-JSN4-J905L  50 HR SERVICE. NO FLUIDS ADDED. EPR
	DESCRIPTION	REPLACED FUEL FIL			PERFORMED SO HR	PERFORMED SO HR :	PERFORMED 50 HR	PERFORMED 50 HR S ADDED 2 GTS ENGLI REPLACED BEARING TROFIT. EPR FB-1 RING ASSY	ADDED 2 OTS ENGII REPLACED BEARING TROFIT. EPR FB-1 RING ASSY ADDED 3.5 GAL HY	PERFORMED 50 HR S ADDED 2 GTS ENGII REPLACED BEARING TROFIT. EPR FB-11 RING ASSY ADDED 3.5 GAL HY REPLACED 0 RING.	ADDED 2 OTS ENGII REPLACED BEARING TROFII. EPR FB-1: RING ASSY ADDED 3.5 GAL HYI REPLACED O RING.	PERFORMED 50 HR S ADDED 2 GTS ENGII REPLACED BEARING TROFIT. EPR FB-11 RING ASSY ADDED 3.5 GAL HY REPLACED 0 RING. ORMED 1-5/16 ID.	ADDED 2 QTS ENGING TROFIT. EPR FB-11. RING ASSY ADDED 3.5 GAL HYING. REPLACED O RING. ADDED 2 QTS ENGIL	PERFORMED 50 HR S ADDED 2 QTS ENGING TROFIT. EPR F8-11 RING ASSY ADDED 3.5 GAL HYI REPLACED O RING. ADDED 9 QTS HYDRI ADDED 9 QTS HYDRI ADDED 2 QTS ENGIN REPLACED PREFORMI NNECTION TO TUBE BE ASSY AND RELI	PERFORMED 50 HR S  MODED 2 QTS ENGING TROFILE EPR FB-11 RING ASSY ADDED 3.5 GAL HYI REPLACED O RING. ADDED 2 QTS HYDRI ADDED 2 QTS ENGII REPLACED PREFORMI NNECTION TO TUBE BRE ASSY AND RELLI KING	PERFORMED 50 HR 3 ADDED 2 QTS ENGING TROFIT. EPR FB-11 RING ASSY ADDED 3.5 GAL HY REPLACED 0 RING. ADDED 9 QTS HYDR. ADDED 9 QTS HYDR. ADDED 2 QTS ENGING REPLACED PREFORM NACTION TO TUBE ORAULIC SYSTEM. KING. REPLACED ELBON OF Y VALVE. EPR FB-	PERFORMED 50 HR SEPLACED BEARING TROFILE EPR FB-11 RING ASSY ADDED 3.5 GAL HYING ADDED 9 QTS HYDRI ADDED 9 QTS HYDRI ADDED 2 QTS ENGILL BREPLACED PREFORMING TING SYSTEM. IN TO	PERFORMED 50 HR SERLACED 2 QTS ENGING TROFIL. EPR FB-11 RING ASSY ADDED 3.5 GAL HYNER PLACED 0 QTS HYDRIAGED 2 QTS ENGING TO TO TUBE BE ASSY AND RELIDEN TO TUBE BE ASSY AND RELIDEN OF Y VALVE. EPR FD-1148
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w e e o	11-951 (1149-11)	1153	1154	1155	1158	1160	1161		1162		1163	
DESCRIPTION	ADDED 1 GAL TRANSMISSION OIL REPLACED ELBON ON HOSE ASSY AT TWO MAY VALVE. EPR FB-1151(1146-1)	90 DEG ELBOW ON HOSE ASSY 56.50,242R4-JSN4-J90SL4 3.0 1 2.7 CHECKED HYDRASTATIC DRIVE CONTROL CIRCUIT AND REPAIRED BROKEN HIRE IN HARNESS.EPR F8-1153	6.0 2 REPLACED WORN CURBSIDE TIRE, EPR FACKING, PREFOWED TIRE PNEUMATIC	PERFORMED 50 HR SERVICE. EPR FB-1155 ,	ADJUSTED SERVICE BRAKES. EPR FB-1156	RMELDED FULL FLOW OIL FILTER MOUNTING BRACKET AND REINSTALLED OM VEHICLE. EPR FB-1160	0.1 REPLACED LAMP IN LOCK-UP INDICATOR. EPR F8-1161	LAMP, LOCK-UP ACTUATOR	REPLACED REAR ROADSIDE FLCOOLIGHT ASST. TIME SHOULD BE CHARGED TO OT 2 TEST EPR FB-1162	FLOODLIGHT ASSY, REAR ROADSIDE	0.1 REPLACED PREFORMED PACKING ON ROADSIDE WHEEL, EPR F8-1163	PREFORMED PACKING, ROADSIDE WHEEL ASSY
Z A Z D	1 2 2 1	3.0 1 2	FACKING, PREFOR	2 9.0	0.5 1	1.5.1	0.3 1 0	IP, LOCK	0.3 1	DODE IGHT	1.0 2 0.1	FORMED
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MAINTELANKE   ASK   LOC   TEST   TE	waan	1164		1165		1166	1167	-					1170	
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NEE TASK   LOG   TEST	DFSCRIPTION	REPLACED AIR FILTERS, FUEL CARTRIDGE, FUEL FILTERS, EPR F8-1164	INNER OUTER FUEL FILTER FUEL FILTER	ADDED 2 OTS TRAMSHISSION CIL. 5 REPLACED THROTTLE SLAVE CYLINDER, EPR F8-1165	IDER. ENGINE TOP CENTER	(PROPORTIONAL VALVE). EPR F8-1166	JUMP	ADDED 1 OF TRANSMISSION OIL	ADDED 4 GALS HYDRAULIC OIL	ADDED 2 QTS HYDRAULIC OIL	ADDED 1.5 QTS TRANSMISSION OIL	ADDED 3 OTS OF ENGINE DIL FAMECI9431312781 1231113.0 UCCACNMODOD 0.3 0.31 ADDED 10 GALS OF HYDRAULIG DIL DUE TO BROKEN PRESSURE SWITCH		NE OIL, FULL FLOW INE OIL, BYPASS OSION RESISTOR BREATHER-HOMT
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	DESCRIPTION	00238 VENT ASSY, BREATHER-TRANSMISSION 00035 FILTER ELEMENT, AIR
H DT R IT GE		00238 VENT ASSY, BREAL 00035 FILTER ELEMENT,
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AINTENANCE TASK LOG 5 OHR A A H DON C T F OUD T		5690922- 360243 1911724

maan			1043	195.	17.	202	203			503	122	1901	1106
DESCRIPTION	00.0 INITIAL INSPECTION OF VEHICLE ON RECEIPT.	00.0 ADJUSTED TIRE PRESSURE TO 45 P.S.1 THE TIRE PRESSURE MAS TOO HIGH, 55 PS1	00.0 PERFORMED 50 HR MAINTENANCE PSR LUBE ORDER LO5-3840-202-12 EPR F8-1049	00.0 REPAIRED CRACK IN ROD END ASSY BY WELDING TWO PIECES OF ANGLE IRON ON OPPOSITE SIDES OF CRACK? ONE HOURS AND INSTALLED MODIFIED LINK. EPR FB-195.	.00.0 SHIFTED SKID SHOES END FOR END FOR EVEN	MEAR DISTRIBUTION. EPR FB-174. 00.0 SCARIFIER TOOTH PIN REPLACED, FELL OUT	00.0 1. REMOVED AND REPLACED END BITS ON DOZER BLADE 2. CENTER CUTTING EDGE	REVERSED FPR F8-203		00.0 ADJUSTED MANUAL TILT LINK, THIS HAPPENS FREQUENTLY AND REQUIPES 1 HR ADJUSTHENT EACH TIME, EPR F3-209	THE LEFT FRONT FENDER WAS STRAIGHTENED BY THE USE OF A CHAIN. EPR F9-221	00.0 PERFORMED 50 HR HAINTENANCE PER LUBE Order LO5-3840-202-12 EPR FB-1061	00.0 PERFORMED 50 HOUR MAINTENANCE EPR FB-1106
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DESCRIPTION	01.4 2 80.0 PERFORMED 250 HR MAINTENANCE PER LUBE ORDER LU5-3040-202-12. ADDED 1 QT 3F 90 HT OIL TO MINCH HOUSING. ADCED 9 SQUIRTS OF OIL TO MID MOUNT. EPR FB-1081 VENT ASSY, BREATHER, HIDMOUNT VENT ASSY, BREATHER, AXLE FILTER ELEMENT, FL, POMER CLUSTER	00.0 RE INSERT SHOULDER PIN ON SCARIFIER TOOTH, THE PIN HAD ALMOST WORKED COMPLETELY OUT EPR F8-1103 00.0 INSTALL NEW R.H. END BIT IN THE DOZER BLADE ASSY ITO REPLACE WORN R.H. END	BIT 00.0 INSTALL NEW CENTER CUTTING EDGE IN THE DOZER BLADE ASSY. (TO REPLACE MORN CUTING EDGE) EPR FB-247 (203-1)	GP=8080827435 NO=81 LIFE=278.6 CENTER CUTTING EBGE C C A M Y N 7435 88.8 80.2 80.2 1 80.8 INSTALL NEW L.H. END BIT IN THE DOZER BLADE ASSY (TO REPLACE MORN BIT) EPR F8-246(283-1)	00.0 INFLATES LEFT FRONT TIRE TO 55PSI. TIRE PRESSURE MAS LOW AT 30PSI.	00.2 1 00.0 REPLACE TWO LUBRICATION FITTINGS EPR F0-299 FITTING, GREASE
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	VENT AS	00.1 1	4. E	CENTER 00.2 1	L.H. E.	90.2 1 FITTIN
FODE	19 991	8 8	8.H.	S S	3 8	8 1
TEST 17EH ,944 C G GO CH S R OL LO F P NY OU F KS	000 00.0 00.7 NO=01 LIFE= 01	.0 00.2	GP=000027435 NO=01 LIFE=154.0 R.H. END BIT C C A M Y N 7435 00.0 01.0 01.0 1 00.0	1FE=278.6	GP=000027435 NO=01 LIFF=154.0 L.H. END 3IT 0 0 A M Y N 1313 00.0 00.3 00.3 1 00.0 P	C C A M Y N 2407 00.0 00.2 GP=000022407 NO=02 LIFF=UNK
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0.4 2 PERFORMED 50 HR. MAINTENANCE PER LUBE 1084 0.2 D20ER LUS202-12. EPR F8-1084 10.9 D8EDVED LEFT FRONT FENDER ON WORK 1110 D8.0 REMOVED LEFT FRONT FENDER NAS BOTH BENT AND 3ROKEN AT THE TOP BRACE. EPR F8-1114 0.2 LOSDER LOS202-12. EPR F8-1085 18.1 1 00.0 REMOVED SCARIFIER TOOTH SHANK (TOOTH 10.2 REMOVED SCARIFIER TOOTH SHANK (TOOTH 11.2 LOSDER LOS202-12. EPR F8-1085 14.0 Z 00.0 STRAIGHTEN OUT FENDER - MELD ON GUSSETT 303 (S-1) 10.2 Z 00.0 PERFORMED 50 HOUR MAINTENANCE EPR 10.4 Z 00.0 STRAIGHTEN OUT FENDER - MELD ON GUSSETT 303 (S-1) 10.6 Z 00.0 REPLACED ADJUSTABLE TILT LINK REMOVED 10.8 EP-1085 10.9 REPLACED ADJUSTABLE TILT LINK REMOVED 10.9 LUBRICATED AFTER INSTALL- ATION. EPR 11 HTH NO MODIFICATIONS. ASSY WAS 12 HTH NO MODIFICATIONS. ASSY WAS 13 F8-309 14.0 SHOE 15 HOUR RAINTENANCE EPR 15 F8-309 16 F8-313 16 F8-313 16 F8-313 17 SHOE 18 F8-1087 18 F8-1087 18 F8-1087
00.4 1 00.0 REMOVED LEFT FRONT FENDER WAS BOTH BENT AND BROKEN AT THE FENDER WAS BOTH BENT AND BROKEN AT THE TOP GRACE. EPR F8-1118  0.2 1 DREPORMED 50 HR. MAINTENANCE PER LUBE 1005  04.1 1 00.0 REMOVED SCARIFIER TOOTH SHANK (TOOTH 302  MISSING). EPR F8-302  00.2 2 00.0 STRAIGHTEN OUT FENDER - MELD ON GUSSETT 3036  MOUNT FENDER EPR F8-303(S-1)  00.2 2 00.0 REPLACED ADJUSTABLE TILT LIMK REHOVED 309  MITH NO MODIFICATIONS. ASSY HAS  LUBRICATED AFTER INSTALLE ATION. EPR F8-309  MATH NO MODIFICATIONS. ASSY HAS  LUBRICATED AFTER INSTALL - ATION. EPR F8-309  SKIO SHOE  00.2 2 00.0 PERFORMED 50 HOUR MAINTENANCE EPR F8-313  F8-313
1 DO.O REPORMED 50 HR, MAINTENANCE PER LUBE 1085 1 DO.O REHOVED SCARIFIER TOOTH SHANK (TOOTH 302 2 DO.O REHOVED SCARIFIER TOOTH SHANK (TOOTH 303) 2 DO.O REHOVED SCARIFIER TOOTH SHANK (TOOTH 303) 2 DO.O REPORMED SO HOUR HAINTENANCE EPR 1086 6 FB-1066 2 DO.O REPLACED ADJUSTABLE TILL LIHK REHOVED 309 DAMAGE OTILL LINK AND INSTALLED NEW ONE MITH NO HOOFFICATIONS. ASSY WAS LUBRICATED AFFER INSTALL- ATION, EPR FB-309 1 DO.O REPLACED 2 WORN OUT SKID SHOES EPR 313 FB-313 SHOE 2 DO.O PEPLORED 50 HOUR HAINTENANCE EPR 313 FB-313
00.1 1 00.0 REHOVED SCARIFIER TOOTH SHANK (TOOTH 302 HISSING). EPR F0-302 04.0 2 00.0 STRAIGHTEN DUT FENDER - WELD ON GUSSETT 3031 MOUNT FENDER EPR F0-303(S-1) 00.2 2 00.0 PERFORMED 50 HOUR MAINTENANCE EPR 1086 F8-1066 F8-1066 F8-1066 F8-1066 F8-1066 ADJUSTABLE TILT LINK REHOVED 309 LUBRICATED AND INSTALLED NEW ONE MITH NO MODIFICATIONS. ASSY WAS LUBRICATED AFTER INSTALL- ATION. EPR F8-309 F8-309 SWID SHOE. F8-513 SKID SHOE F8-513 F8-51087
2 00.0 STRAIGHTEN DUT FENDER - WELD ON GUSSETT 303.0 2 00.0 PERFORMED 50 HOUR HAINTENANCE EPR 1086 59-1066 2 00.0 REPLACED ADJUSTABLE TILT LINK REMOVED 309 0 DAMAGED TILT LINK AND INSTALLED NEW ONE HITH NO MODIFICATIONS. ASSY WAS LUBRICATED AFTER INSTALL- ATION. EPR 69-309 1 00.0 REPLACED Z WORN OUT SKID SHOES EPR 313 F8-313 SHOE 2 00.0 PERFORMED 50 HOUR MAINTENANCE EPR 1087
2 00.0 PERFORMED 50 HOUR MAINTENANCE EPR 1086 F8-1066 2 00.0 REPLACED ADJUSTABLE TILT LIMK REMOVED 309 DAMAGED TILT LIMK AND INSTALLED NEW ONE MITH NO HODIFICATIONS. ASSY WAS LUBRICATED AFTER INSTALL—ATION. EPR F8-309 1 00.0 REPLACED 2 WORN OUT SKID SHOES EPR 313 F8-313 SHOE 2 00.0 PERFORMED 50 HOUR MAINTENANCE EPR 1087 F8-1087
ADJUSTABLE TILT LINK AND INSTALLED NEW ONE HITH NO MODIFICATIONS, ASSY WAS LUBRICATED AFTER INSTALL—ATTON. EPR FB-309  ADJUSTABLE TILT LINK LOCATED ON CURBSIDE OF VEHICLE AT THE DOZER BLADE.  SKID SHOE  60.2 2 00.0 PERFORMED 50 HOUR MAINTENANCE EPR 1097
F8-309 STABLE TILT LINK LOCATED ON CURBSICE OF VEHICLE AT THE DOZER BLADE.  1 00.0 REPLACED 2 WORN OUT SKID SHOES EPR 313 F8-313 SHOE 2 00.0 PERFORMED 50 HOUR MAINTENANCE EPR 1097
MALE TILT LINK LOCATED ON CURBSIDE OF VEHICLE AT 158 BLADE.  100.0 REPLACED Z WORN OUT SKID SHOES EPR F8-313  100.0 PERFORMED 50 HOUR MAINTENANCE EPR F8-1007
FB-513 FB-513 FB-513 FB-513 FB-513 FB-513 FB-513 FFB-513 FFB-5
9.9 PERFORMED 50 HOUR MAINTENANCE EPR F8-1087
2 00.0 PERFORMED 50 HOUR MAINTENANCE EPR F8-1087

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DI IIT AM GE DESCRIPTION	88.8 F8-317	BOLT, PLOM	VENT ASSY, BREATHER, HIDMOUNT VENT ASSY, BREATHER, AXLE FILTER ELEMENT, FL, POWER CLUSTER	00.0 REPLACE BROKEN FITTINGS ON AIR MANIFOLD ASSY. EPR FB-318 OR. AIR HOSE	88.2 DISCONNECTED 2 AIR HOSES AND RECONNECTED PROPERLY EPR F8-319	TOOTH, SURP RIPPING PINS EPX TOOTH, SURP RIPPING PIN STRAIGHT, HEADED SHANK-TOOTH, SURF. RPG,	50 HR LUBRICATION PER LOS-3540-202-12. 42 HL HD-EO TO MIDHOUNT BEARING EPR F8-1088	00.0 REPLACED 2 BROKEN AIR HOSE CONNECTORS IN THE AIR HANIFOLD EPR FB-325 R, AIR HOSE	00.0 CENTER CUTTING EDGE WORN CUT. REVERSED EDGE + REINSTALLED EPR FB- 526
E W X	2 2.00	NUT, SLFLK BOLT, PLOW	VENT AS VENT AS FILTER	ADAPTER CONNECTOR, HOSEEND	01.6 2	PIN STR SHANK-T	0.2 1	00.9 1 ONNECTO	2 0.00
K LJG IEST , FAMEGEL TEST ITEM , 944.  A T S F E T Q A C G CD CH C A J C C M A M S R OL LO T S U H M * T F P NY CR N K R S T CR	.0 U C C A M Y M 7436 00.0 00.1	6P=000027436 NO=16 LIFE=UNK 000027436 16 16 UNK	GP=000020300 NO=01 LIFE=257.4 G00021000 01 257.4 G000120300 01 257.4	6F=000021208 NO=01 LIFE=UNK 000021208 O 1 UNK 000021208 O 1 UNK	.0 U 0 0 I M Y Y 1208 00.0 00.5	GP= 027435 NO=04 LIFF=369.3 027435 04 369.3 027435 02 369.3	3.3 019.04 S O O A M Y N 9000 0.2	.1 U O D A M N 1208 00.0 00.9 GP=000021208 NO=02 LIFE=68.1C	.0 U O O A M Y Y 7435 00.0 02.0
93705/73 MAINTEHANCE TESK D S OHR A H DON T F OUD	14/11/77 1 506.0 016	PARTS 170-54 1552864	PARIS 569022-03 AC43867	14/11/77 2 506.3 017 PARTS 69FS 727-4-4	15/11/77 2 508.7 018	PARTS R151258 R135388 R112228	21/11/77 1 563.3 019.04	21/11/77 1 563.3 019 PARTS 8M-6JMS	21/11/77 2 564.7 020.0 CRITICALITY FACTOR= 1.0

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					IS EPR		ANCE EPR	NEW ADJUSTABLE TILT LINK AS 1559 EPR F8-649		00.0 INSTALLED NEW GUARD, WINCH CASLE AS PER CEC ECN 1559 EPR F8-700		88.1 ADDED 1 GALLON OF FLUID TO TRANSMISSION	O REPLACED MISSING MACHINE BOLT AND LOCK. NUT WITH A SUBSTITUTE BOLT AND NUT OF LIKE SIZE, RECCOMENDED BOLT AND NUT NOT AVAILABLE IN MISP, EPR F8-715	5.	the second secon	546-64 P		REMOUNTED WIRING HARNESS PROTECTOR EPR -945	BRACKET
					H END 81		R MAINTE	JUSTABLE		ARD. WIN		r rwio	UTE BOLT NDE D BOL EPR FB-7	FPR F8-94		TEETH EPA	***************************************	HARNESS	HOUNT ING
			NO				0 50 ноп	NEH AD		S EPR FU		ALLON 0	MISSING SUBSTIT RECCOME IN HISP.	TIRES.	-	RIPPER		MIRING .	FENDER
			DESCRIPTION		00.0 INSTALLED LH . RH END BITS EPR FB-539(S-2).		00.0 PERFORMED SO HOUR MAINTENANCE EPR F9-619	DO.D INSTALLED PER CEC ESN	GP=000027436 NO=01 LIFF=375.0 TILT LINK, ADJUSTABLE	CEC ECN 1559 EPR F8-700	GUARD, WINCH CABLE	.1 A00E 0 1 G	00.0 REPLACED MISSING MACHINE BO NUT WITH A SUBSTITUTE BOLT AN LIKE SIZE, RECCOMENDED BOLT A AVAILABLE IN MISP, EPR F8-715	REPLACED TIRES. EPR F8-945	TIRE PNEUMATIC PACKING PREFORMED	REPLACED RIPPER TEETH EPR F9-945	SHK-TOOTH, SJAF APG. TOOTH, SURF. RIPPING	REMOUNTED	TIGHTENED FENDER MOUNTING BRACKET BOLTS. EPR F8-945
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TASK LCG TEST , FAMECEI 1EST 1TEH , 945  OHR A 1 5 E E 1 Q A C C C A A C C C A A B S R OL LO AG E I OUGH C A C C A A B S R OL LO AG E I OUGH C A C C A A B S R OL LO AG R  HES N K A S T F P NY CR R  OUGH C A C C A A Y N 0613 06.0 00.1 00.1 1  OUGH C A C C A A Y N 0613 06.0 00.1 00.1 1  OUGH C A C C A A Y N 1501 00.0 00.1 00.1 1  OUGH C A C A A Y N 1501 00.0 00.1 00.1 1  OUGH C A A Y N 1501 00.0 00.1 00.1 1  OUGH C A A Y N 1501 00.0 00.1 00.1 1  OUGH C A A Y N 1501 00.0 00.1 00.1 1  OUGH C A A Y N 1501 00.0 00.1 00.1 1  OUGH C A A A Y N 1501 00.0 00.1 00.1 1  OUGH C A A A Y N 1501 00.0 00.1 00.1 1  OUGH C A A A Y N 1501 00.0 00.1 00.1 1					DESCRIPTION		RECONNECTED R.O.P.S. FLOODLIGHT LEADS MHICH HAD BEEN PULLED LOOSE THROUGH CONTACT MITH TREE LIMBS CHECKING, AND/OR RECONNECTING THESE LEADS ARE OPERSCRIBED PORTION OF PHICS BY OPERATOR/CREW EPR FB-FFRDS 81		HEDEFORMED LADDER WAS CONTACTING TIRE AND WAS REHOWED TO AVOID FUDTHER DAMAGE TO THE THE DATE OF THE ACTION WAS COUNTERACTIVE, CORRECTIVE ACTION DEFERRED EPR FB-FFRDSD2	O LEAKING ENGINE OIL PRESSURE SENDER REPLACED. CONDITION DETECTED AND CORRESTED AT POST-OP PMCS BY ORG LEVEL. EPR FB-FFRD504.	. PRESSURE, ENGINE	O DURING POST-OP PMCS, OPERATOR, (MIL.) STRAIGHTENED LADDER WHICH HAD BEEN DEFORMED JURING MISSION. EPR.	O DRG LEVEL MAINTENANCE (MIL) REPLACED DAMAGE SECTION OF HOSE AT JUNCTION OF FITTING IN TRANSMISSION AND DIPSTICK TUBE, THEN REPLACED LOST TRANSMISSION DIL AND CHECKED EPR F8-FFROSOS	0.00	TASK IS NJT SPECIFICALLY ADDRESSED BY HAC, HOWEVER IT COULD BE CONSIDERED A REPAIR OF THE WINDSHIELD ASSEMBLY WHICH WOULD THE WINDSHIELD ASSEMBLY WHICH NOULD THEN BE ALLOCATED TO D. S. TASK IS SIMPLE AND COULD BE REASONABLY PERFORMED BY DAG. EXCEPT THAT SHR CODE INDICATES ANALLABILITY OF REPLACEMENT PART AT 0. S. EPR FG-FFROSCO	
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mean	FFR0507	FFR0512.	FROSTO	FFR0510	FFR0510.
OT III AH GE DESCRIPTION	MINDSHIELD ASSEMBLY  00.0 OPERATOR REPLACED TAPERED PIN SECURINS LEVER OF FORMARD/REVERSE CONTROL TO IT'S ELECTRICAL SHITCH, TASK WAS EASILY ACCOMPLISHEDITH OF M. TOOLS IN THE		FROM COMPOSITE LIGHT. IT SHOULD BE NOTED TRAFFE LIGHT. IT SHOULD BE NOTED TRAFFICE AND COUNTERACTIVE MEASURE WERE SAME ACTION. CORRECTIVE ACTION DEFERRED EPR FB-FFROSIZ.5  00.0 BRG LEVEL MAINTENANCE REMCVED/REPLACED WINDSHIELD ASSEMBLY. WINDSHIELD HAD BEEN BROKEN THROUGH IMPROPER OPERATIONAL PROCEDURES BEING USED (NOTE) HAUGSHIELD WAS REMOVED. THEM REPAIRED, AND SAME ASSEMBLY REPLACED ON	VEHICLE ALSO SEE ACTION TA FOR REPAIRIONIL PERSONNEL PERFORMED TASKIEPR FB-FFROSIO 00.0 DIRECT SUPPORTICIVI REPAIRED WINDSHIELD ASSEMBLY BY REPLACING A BROKEN WISION FB-FFROSIO	CC C A W Y N 0103 00.0 00.0 00.0 1 00.0 DUPING MISSION, OPERATOR HIL, CLOSED DRAIN WALE ON FUEL FILTER HAD STOPPED, AND COULD NOT BE RESTARTED.  810 PEC D186NOSTIC AND CORRECTIVE TIME WAS 30 SECONDS OR 0.0093 HRS. EPR FIRE FRANCED.
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163 x	LOUVER.	90.1	2.00	4.00	00.0 1
ST .FAMECE1 TEST ITEM ,945 S F E T Q A G G G C CH Z C C M A H S R OL LO U H H ' T F P NY OU R S T CR	GP=011802A99 NO=01 LIFE= U C C I M Y N 0106 00.0 00.2	U C O I M Y Y 0609 00.0 00.1	U G G A M N N 1862 GO.O 00.3	U F F A C H N 1802 06.0 00.2	GF=011802A99 NO=01 LIFE=00125 U C C A M Y N 0103 00.0 00.0
0145 K LOG 16 DOT	00107 004.0	00119 005.0	10125 006.0	10125 005.0A U	00156 007.0
03/05/79 HAINTENANCE T D S O A A H H O T T T M	FARTS 2545862	04/11/77 0	02/11/77 1 00125	02/11/77 1 00125	DAKTS 2545974 33/11/77 00

waan	FFR0510	FFR0511	FFR0511		FFR0513		FFR051 •	FFR0515	
DESCRIPTION	OPERATOR (MILITARY) REALIGNED HOSE ON FADAPTER AND TRANSMISSION FILLER (OIPSTICK) TUBE, THEN RETIGHTLNED CLAMP.EPR FB-FR0510.1	MATCH HAD BEEN DAMAGED BECAUSE OF IMPROPER 2 PERATING PROCEDURES BEING USED. CORRECTIVE ACTION (REPLACEMENT) DEFERRED EPR FB-FFRO511A	0.3 ORG LEVEL MAINT (MILIYARY) REPLACEO FITTINF ON STEER CYL WMICH HAD A PIN HOLE EPR FB-FFR0511.5	The second secon	HAINTENANCE REPLACED ADAPTER HED PACKING) BROKEN T WHEN STRUCK BY TREE WHICH SCRED DOWN AND WAS BEING C.— INDIE THIS ACTION WAS ELY PERFORMED RESULTING IN RE SEE ACTION 90A) EPR	ADAPTER PACKING/PREFORMED (MITH ABOVE AT HYDRAULIC MANIFOLD	CHIL) STRAIGHTENED LIGHT GAURD GHT ASSEMBLY DAHAGED WHEN ACROSS VEHICLE O.E.M. TOOLS TO PERFORM TASK. DURING E WASHERS WERE LOST AND WILL REPLACED LATER - POST OHR MAINTENANCE EPR	EPLACEO PREFORMED PACKING, TENED ADAPIER AND COUPLER, DEEN WORKED ON APPROXIMATELY ARLIER, (SEE ACTIONR, 0) EPR	
OT AAM GE DES	ADAPT (DIPS	MHICH IMPRO USEO.	0.3 0RG FITTI HOLE	H STEER	GOOG LEVEL (AND PREFOR ACCIDENTALL HAD BEEN KN PUSHED BAT NOT ADEQUAT LATER FAILUT	PREFORME	AND HEADLI TREE FELL WERE USED ACTION SOUTH HAVE TO BE MISSION/25 FB-FFR0514	MINUTESI R AND RETIGH WHICH HAD 11 HOURS E	
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wa	æ ss	FR0516	FFR0510	FFR0516.5	FR0520	R0521
LOG TEST FAMECEL TEST ITEM 945  T S E E T Q A C G CO CH HH A M S R OL LO AO E IT  N K R S T F P NY OU NU E IT  KS T KS T F P NY OU NU E IT  KS R S T F P NY OU NU E IT  KS R S GE	011.0 U O O H C Y Y 0309 00.0 00.8 01.4	AND COULD NOT BE RESTARTED. WINDTES  AND COULD NOT BE RESTARTED. ONE  ENTRY ORGING TO THE L. CLY) THENSPENY  OFFINE ONE ONE FOLTER TO THE L. CLY) THENSPENY  OFFINE ONE ONE FOLTER TO THE L. CLY THENSPENY  OFFINE ONE ONE OF FOLTER TO THE THE THEN CHANGED.  INTER ONE OF THE THEN CHANGED.  INTER ONE OF THE THEN CHANGED.  INTER ONE OF THE THEN CHANGED.  OCC. A M.S. ALSO REFULED. BUT THIS ERF.	TELTER, FUEL  SECTION PARKING BRAKE, GOUNFRACTIVE  SECTION PARKING BRAKE, GOUNFRACTIVE  BACTION WAS REQUIRED BECAUSE CABLE HAD  BECOME KINKED PREVENTING BRAKE  FROM 9EINS FULLY RELEASED CONCOTING  ACTION REPLACEMENT OF CABLE DEFREG.  EPR F9-FRD518  EPR F9-FRD518  CABLE DEFREG.	GP=011211E99 NO=01 LIFE=00201 COUPLING, EMERGENCY COUPLING (GLAD HAND) SROKEN VEHICLE WHICH HAS STUCK IN HUD. EPR DOZER U 0 0 H M Y Y 1411 00.4 00.1 00.1	OS.O DEC LEVEL HAINTENANCE (MIL) REPLACED DEFECTIVE PREFORMED PACKING TO RING) ON FO-FROSZO OF RING) ON FOREFORMED OF RING) ON TO PREFORMED (REF ASSOCIATED WITH FITTING! FIG.	PEPLACEMENT OF HOSE ASSEMBLY MAS PER PRINCES OF ORGINE ASSEMBLY MAS PER PRINCES OF ORGINE ASSEMBLY MAS ADDRESSED BY ORGINE SINCE STORE COMPONENTS OF THE MAC. SINCE COMPONENTS REMOVED/REPLACED BY ORG. AND SINCE SUCH MOULD SEEM LOGICAL THAT ORGINES OF THE TORGINES OF THAT ORGINES OF THAT
03/05/79 INTENANCE TASS ON S OHR T F DON E T MRS	00199	PARIS 2910-00-207-1912 07/11/77 00200 011.1	07711/77 00201 012.0	PARTS 4730-00-232-5440 08/11/77 00221 013.0	PARTS 1300294 09/11/77 835 014,0	
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w a & c		FIG 103	;						FFRDSO	FFR051
I OT I I I I I I I I I I I I I I I I I I	DESCRIPTION	E ASSEMBLY, AIR MANIFOLD (REF DEPS-XXX-201-20XP, FIG 103 ITEM 8) 1 1 00.0 OPERATOR, (MIL) NOTED AND REPLACED MISSING HARDWARE ON MINOSHIELD ASSEMBLY ACTION MAS TAKEN WHILE VEHICLE MAS DOWN FOR HOSE REPLACEMENT (SEE ACTION	SCREW, CAP, HEX HEAD, WINDSHIELD ASSY FIG 128 ITEMS 1+2	02.4. 2. 90.0 ORG. LEVEL MAINTENANCE PERFORMED QUARTERLY SCHEDULED MAINTENANCE, POWER SECTION, DOZER VEHICLE (250 HR)	ELEMENT, ENGINE OIL FILTER, FULL FLOM Gasket (USED MITH ABOVE ITEM ELEMENT, ENGINE OIL FILTER, E PASS	1	CARTRIDGE, FUEL FILTER Gasket (Used With Agove Item) Element, Water Filter (Currosion Resist)	VENT ASSY, BREATHER, CONVERTER QUARTERLY SCHEDULED HAINTENANCE ELEMENT, TRANSHISSION OIL FILTER ACKING, PREFORMED (USED MITH ABOVE) VENT ASSY, BREATHER, MIDMOUNT	00.2 1 00.0 ORG LEVEL MAINTENANCE REPLACED L M LADDER ASSEMBLY WHICH HAD BEEN REMOVED AT HHR 93.2 EPR F9-FFR0502A	2 1 00.0 ORG LEVEL MAINTEMANCE REPLACED R H LADDER ASSEMBLY WHICH HAD BEEN DAMAGE AND REMOYED AT HMR 1622, ACTION TAKEN AT QUARTERLY (250 MR) SCHEDULFD
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	2	00.0 ORG LEVEL MAINTENANCE (,IL) REPLACED STEERING JONTROL VALVE DUE TO LEAK AT SEAL ON SHAFT. EPR F8-FFR0524	GP=011414910 NO=01 LIFE=00281 VALVE, STEERING CONTROL REF DEPS-XXXX-201-20YP, FIG 107,	POST OP PHCS, OPERATOR (HIL.) LOST HARDHARE AT A FUEL TANK BRACKET, EPR FB-FR0525		CCIV.,) REPLACED OUND TO BE S. EPR	E.	RFORMED IANCEL POWER HR	and the second s					STI			
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	OESCRIPTION	.O ORG LEVEL MA Steering Jonth Seal on Shaft.	ERING CONTROL REF	REPLACED LOST HARDWA	SCREW, GAP, HEX HEAD MASHER, FLAT NUI, HEX	00.4 ORG LEVEL MAINTENANCE, (CIV.,) SENDER MOJNTING BRACKET FOUND TO LEAKING DURING PRE-OP PMCS. EPR FB-FFRD527.5	GP=010106999 NO=01 LIFF=00455 BRACKET, SENDER HTG. RH BANK OF ENGINE.	DD.D ORG, LEVEL HAINTENANCE PERFORMED QUARTERLY SCHEDULED MAINTENANCE, POMER SECTION, DOZER VEHICLE (500 HR	ELEMENT, ENGINE OIL FILTER, FULL FLOW	ELEMENT, ENGINE OIL FILTER, 87 P	GASKET, COVER (USED MITH ABOVE I	CARTRIDGE, FUEL FILTER	GASKET (USED WITH ABOVE ITEM)	ATER FILTER (CORROSION	VENT ASSY, BREATHER, CONVERTER	ELEMENT, TRANSMISSION OIL FILIER	STATE OF THE OWNER WINDS
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H DT  N AM  GE  DESCRIPTION  1 00.0 ORG LEVEL MAINTENANCE REPAIRED MIRING PAREL OF POMER SECTION. CORRECTIVE  ACTION TAKEN AT END OF POT-C. FAILURE OCCURRED AT HMR 166.8 EPR F0FFED512.5	r, LIGH	E. REMOTE ACTUATOR, (PARKING BRAKE)  1. 00.0 ORG LEVEL HAINTENANCE REPLACED LOCK RING CONTROL CABLE ASSY WHICH HAD BEEN BROKEN AT HHR 114.9. CORRECTIVE ACTION TAKEN AT END OF PQT-C. EPR FB-FFR0508A ROL CABLE ASSY, LOCK RING	00.0 0 00.0 REPLACEHENT HIRROR ASSEMBLIES PROVIDED FOR THOSE DANAGED DURING PQI-C TESTING.THESE ITEMS ARE NOT INSTALLED BUT ARE SKIPPED OFF EQUIPMENT. EPR FB-FRD505.5,509.5 HIRROR HIG ARH ASSY (RH SIDE) HIRROR HAD (RH SIDE) HIRROR HAD (LH SIDE) SPOT HIRROR (LH SIDE)	1 00.0 LOWER DOLLY WHEEL CYLINDER PRESSURE AIRCRAFT LOADING REQUIREMENTS EPR FB-899 1 00.0 RE-ADJUST STEERING PRESSURE FROM 2700 PS1 TO 2500 PS1 EPR FB-897
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· wi e	<b>. .</b>	FFR3509			FFR0513.5	FFR0517		OF ACTION JRS AS
	DESCRIPTION	00.0 PRG MAINTENANCE (MIL) REPLACED L.H. ROD END ASSEMBLY OF THE ASJUSTABLE 75 TILT LINK ASSEMBLY. MAC DOES NOT SPECIFICALLY ADDRESS THIS TASK HOMEVER TILL CYLLHOER IS REPLACED AT DRG AND	THIS TASK IS SIMILAR (EASIER) REPLACEMENTOF ROJ END IS IN TURN SIMPLEKYSAFEX QUICKER, THAN ELDERGENET OF WHOLE ADJUSTABLE TILT LINK ASSEMBLY SHR CODE INDICATESTHAT ROD END IS STOCKED AT D.S. HOMEVER NEEDED ITEM COULD BE TAKEN FROM GOOD ASSY EPR F9-FFRDS03	GP=027436901 NO=01 LIFE=00079 ROD END ASSY L.H. ADJ, TILT LINK, ASSY	REPLACED THE FORK SHIFTER OF THE DOZER MINCH ASSEMBLY AT HMR 2399 UDDZER SECTION LIFE 1921ITEM HAD BEEN BROKEN DUE IMPROPER/UNSAFE PROCEDURES AT HMR 174.5 AND CORRECTIVE ACTION WAS DEFERED. EPR F8-FFROSI.5	PARKING BRAKE USING O.E.M. TOOLS. COUNTERACTIVE MEASURE MAS NECCESITATED OUE TO DAMAGE CAUSED WHEN TREE FELL ACROSS PARKING BRAKE CONTROL LEVER - REPAIR/REPLACEMENT OF LEVER OFFRED.	00.0 ADJUSTABLE FILT LINK ASSEMBLY REPLACED OF ORS LEVEL HAINTENANCE, TILT LINK WAS BROKEN THROUGH VEHICLE ASSIDENT WHILE PULLING IT OUT OF SOFT SOIL. EAC ONES NOT SEDILELER TASK IS SIMILAR TO CYLINDER REPLACEMENT ALLICATED TO ONG. SHR CODE IN MANUALS SHOWS AVAILABLLITY AT 0.5. WHILE LSAR REPORT INDICATES AVAILABILITY AT 0.66.	GP=027436901 NO=01 LIFF=00162 ADJUSTAGLE TILT LINK ASSMBLY (NOTE L.H. ROJ ASSEMJLY OF THIS TILT LINK WAS REPLACED 84 HOURS EARLIER SEE ACTION 6YFR DS09. PART LIFE OF TOTAL ASSEMBLY IS 162 HJURS ASSHOWN)
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				DESCRIPTION	OPERATOR TOOK COUNTERACTIVE HEASURES TO PERHIT OPERATION TO CONTINUE REMOVING APPROXIMATELY 30 FEET OF DEFECTIVE/OAMAGED GABLE AND REPLACING HOOK ON REMAINING GOOD GABLE 0.E.M.	00.0 ORG LEVEL MAINTENANCE PERFORMED QUARTERLY SCHEOULED MAINTENANCE ON DOZER SECTION(250HR)	GP=020900000 NO=01 LIFE=00192 VENT ASSY, BREATHER, HIDMOUNT 021000901 01 00192 VENT ASSY BREATHER, AXLE	SHOES AND ASSOCIATED FLOW BCLTS AND SHOES AND ASSOCIATED FLOW BCLTS AND SELF-LOCKING NOTS. NOTE SKID SHOES WERE LOST BECAUSE PROPER INSPECTION AND /OR PREVENTATIVE MAINTENANCE PROCEDURES WERE NOT ADHERE NOT ADHERE OF A BOHERE OF A BOH		SKID PLOW SELF LOCKING HEX (REFERENCE FIG 36, ITEMS 6,7,8)	00.7 00.7 1 00.0 ORG LEVEL HANTENANCE IMIL) REPLACED WINCH CASLE THAT HAD BEEN BROKEN BECAUSE OPERATOR FAILED TO USE PROPER PROCEDURES EPR FB-FFR0528		FORK SHIFTER ON MINCH ASSEMBLY.  CORRECTIVE ACTION TAKEN AT END OF POT-C FAILURE OCCURED AT HAR 373, INITIAL FAILURE WAS AT LEAST CONFIGURED TO BY
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					DESCRIPTION	009.0G U O O A C Y N 0609 00.0 00.1 00.1 1 00.0 ORG LEVEL PERSONNEL REPLACEO/SECURED B.O. HEADLIGHT ON DOZER SECTION DURING GENERAL CLEAN UP, AT END OF POT-C. PRIOR TO PAINTING VEHICLE.	010.0 U O O A M Y Y 1206 00.0 00.1 00.2 2 00.0 REPLACED CRACKED AIR HOSE CONNECTOR EPR 900	GP=000021206 NO=01 LIFE=513.1 CONNECTOR, AIR HOSE	TIGHTENED LONER FITTING ON HYDRAULIC QUICK DISCONNECT MANIFOLD. EPR F8-975 ITEM 1	TICHTENED UPPER FITTING ON HYDRAUCIC QUICK DISCONNECT HANTFOLD. EPR FB-975
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maan	FFRS502	FFRSSOT	FFR5508			FFRS511
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DESCRIPTION	00.0 OPERATOR, (MIL,) REPLACED SEALED BEAM UNIT IN SERVICE HEADLINGT WHILE VEHICLE HAS DOWN FOR PREFORMED PACKING REPLASEMENT (ACT 1.0) EPR F9-FFRS502	GF=010609903 NO=01 LIFE=00172 LAMP, SEALED BEAM, SERVICE HEADLIGHT C C A M Y N 0609 00.0 00.1 00.1 1 00.0 DURING POST OP PHCS, OPERATOR, (MIL,) FOUND AND REPLACED A BURNED OUT SEALED BEAM UNIT IN THE POWER SECTION SERVICE HEADLIGHT EPR FR-FFRS507	LAMP, SEALED BEAM, SERVICE HEADLIGHT,  00.1 1 00.0 ORG. LEVEL MAINTENANCE, (MIL.) REPLACED CONVERTER TEMPERATURE GAUGE ILLUMINATION LAMP DURING QUARTERLY SCHEDULED MAINTENANCE, HMR 239.8 EPR	GAUGE ILLUMINATION, ICONV. TEMP.)  10.0 IRG. LEVEL MAINTENANCE PERFORMED  OUARTERLY SCHEDULED MAINTENANCE, POWER SECTION, SCRAPER VEHICLE (1250 HR)	ELEMENT, ENGINE DIL FILTER, FULL FLOM GASKET (USED MITH ABOVE ITEM) ELEMENT, ENGINE DIL FILTER, BY PASS GASKET, COVER (USED MITH ABOVE ITEM) ELEMENT, AIR CLEAMER GASKET (USED WITH ABOVE ITEM) ELEMENT, WATER FILTER (CORROSION RESIST) ELEMENT, WATER FILTER (CORROSION RESIST) ELEMENT, RANAMISSION OIL FILTER PACKING, PREFORMED (USED WITH ABOVE)	00.0 ORG LEVEL MAINTENANCE (MIL) REPLACED BY ENGINE OIL FILTER ELEMENTS WHICH HAD NOT BEEN AVAILABLE WHEN O MAINTENANCE HAS DERFORMED AT HAR 29.6. VEHICLE WAS DOWN DUE TO PROBLEM WITH HYDROSTATIC
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		DESCRIPTION	CP=D1D1D6D0D NO=D2 LIFE=D0274 ELEMENT BY PASS ENGIME OIL FILTER	00.0 ORG. LEVEL MAINTENANCE, IMIL,) REPLACED F TERMINAL ON MIRING HARMESS. DAMAGE NOTEO BY OPERATOR OUPING POST OF PMGS, CORRECTIVE ACTION TAKEN AT THAT TIME. EPR F9-FFRS514	GP-819613981 NO=01 LIFE=00289 TERMINAL, RING, SOLDERLESS COMMECTOR (POINT OF CONTACT IS Engine oil pressure sender 1	00.0 DRG. LEVEL MAINTENANCE, (MIL.) REPLACED F AUTOMATIC ORAIN VALVE BROKEN OFF OF AIR RESERVOIR AS A RESULT OF VEHICLE ACCIDENT EPR FB-FRSSIS	NO*01 LIFE=00308 VALVE, DRAIN, AUTOMATIC 01 00308 REGUCER, PIPE (USED MITH AGOVE) ITEMS LOGSYRF ON "GRY" TANK - 2nd reservoir from compressor.	00.0 ORG. LEVEL MAINTENANCE, FHIL, REPLACED F AUTOMATIC ORAIN VALVE, THIS IS SAME ITEM REPLACED IN ACTION 11 EPR FB-FFRSSSS	NO.01 LIFF=00088 VALVE, DPAIN, AUTOMATIC - (P.S. "DRY"TANK) 01 00088 PEDUCER, PIPE (USED WITH ABOVE)	DOSG. LEVEL MAINTENANCE, (CIV.,) RENOVED F POWER SECTION MIDMOUNT SO THAT IT COULD BE USED AS A REPLACEMENT PART FOR THE GRADGE VEHICLE POWER SECTIONN 446 X 116. NO FAILURE OF SCRAPER VHICLE INVOLVED. EPR F8-FFRSS29	REPLACED AUTOMATIC DRAIN VALVE WHICH MES TORN FROM AIR RESERVOIR DURING OPERATION IN MUDOT WORK ARFA. THIS ITEM REPLACED ON TWO PREVIOUS OCCASSIONS. SEE ACTIONS 11.0 AND 15.0 EFR
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03/05/79	5		2	14/11/71	2	15/11/77	15	13/11/77	2	22/11/77	29/11/17
9			AP	3	A	151	4	13/	4	/22	63

GP=011208A99 NO=01 LIFF=00100 VALVE, DRAIN, AUTOMATIC (P.S. 'ODY'TANK) 011208A99 01 011 00100 REDUCER, PIPE (USED MITH ABOVE)

FARTS 281923 19F-5

.w & & m	FF85511.7	FFRSS33			FFRSSZIA
M AM GE DESCRIPTION	00.1 1 00.0 ORG. LEVEL MAINTENANCE, (HIL,) REPLACED DRAIN VALVE WHICH HAD BEEN TORN FROM AIR RESERVOIR DURING OPERATION IN MUDOY WORK AREA. THIS ITEM HAD BEEN REPLACED JUST 7 HOURS EARLIER FOR SAFE REASON, AND ON TWO PREVIOUS OCCASSIONS FOR DIFFERENT REASONS. THIS ITEM WAS ALSO BENT, BUT NOT BROKEKN, JUST 4 HOURS LATTER. EPR F8-FFRSS31.7	VALVE, DRAIN, AUTOMATIC (RS. 'MET' TANK) REDUCER, PIPE (USED MITH ABOVE) 01.0 1 00.0 ORG. LEVEL MAINTENANCE, (CIV) REPLACED NEUTRAL TRANSMISSION CONTROL SOLENOID. EPR F8-FFRSS33	GP=010706G02 HO=01 LIFE=00507 SOLENOID, TRANSHISSION CONTROL, NEUTRAL  O O A C Y N 0000 00.0 03.0 03.2 2 00.0 0RG. LEVEL MAINTENANCE PERFORMED  QUARTERLY SCHEDULED MAINTENANCE\ POWER SECTION, SCRAPER YEHICLE 1500 HRI	ELEMENT, ENGINE DIL FILTER, FULL FLOM GASKET (USED HITH ABOVE ITEM) ELEMENT, ENGINE DIL FILTER, BY PASS BASKET, GOVER (USED MITH ABOVE ITEM) ELEMENT, AIR CLEANER GE, FUEL FILTER (GORROSION RESIST) VENT ASSY, BREATHER, CONVERTER QUARTERLY SCHEDULED MAINTEMANGE ELEMENT, TRANSHISSION OIL FILTER PACKING, PREFORMED (USED MITH ABOVE)	00.2 1 00.0 ORS LEVEL MAINTENANCE ADJUSTED POWER SECTION PARKING BRAKE EPR FB-FFRS521A
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7164 947 C0 C0 O1 O2 N N C0	0.00	-01 LIFE	= 61 LIFE 0 00.0	MO=Q2 LIFE=QQ267 02 00253 02 00253 01 00253 01 00267 01 00267 01 00267 01 00267	1 00.0
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0 3/05/79 MAINTENANCE 0 A H 1 T F F	29/11/77	PARTS 281923 19F-5 30/11/77 0	PARTS 236402 09/12/77 0	PARTS 22 22 22 22 22 22 22 22 22 22 22 22 22	03/12/77

	. a	a			FFRSSSIA	FFR5513A	1017		1017	1017	1017	1101		1017	1101	1101	1101	11017
				DESCRIPTION	00.0 ORG LEVEL MAINTENANCE REMCVEO/REPLACED FUEL TANK EPR F8-FFRSS31A	00.0 DIRECT SUPPORT LEVEL MAINTENANCE REPLACED/MELDED FUEL TANK MOUNTING BRACKET EPR F8-FFRS\$13A	REPLACED RIGHT FRONT TURN SIGNAL BULB EPR F8-1017	LAMP INCANDESCENT	REMOVED PAINT OFF RIGHT FROHT BLACKOUT	ADDED COOLANT TO SURGE TANK EPR F8-1017	REMOUNTED RUBBER BOOT ON PARKING BRAKE EPR F8-1017	REPLACED CORROSION INHIBITOR EPR FB-1017	CP=000010508 NO=01 LIFE=00057 FILTER, CORROSION RESISTOR	TIGHTENED EXHAUST CLAMP BOLTS EPR F8-1017	CLEANED . SERVICED PATTERIES AND TIGHTENED CABLES AT BATTERY POSTS AND MASTER SWITCH. EPR FB-1017	TIGHTENED OIL DRAIN PLUG EPR F9-1017	REMOUNTED AND TIGHTENED PROPSHAFT DUST SHIELD EP? F8-1017	TIGHTEN HYDRAULIC LINE CLAMP EPR
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		۵	~		1017		1017	1019		1020		1021	
				DESCRIPTION	REPOSITIONED SURGE TANK AND REPLACED SURGE TANK BOLT. EPR F8-1017		TIGHTENED HOSE FITTING AT OIL COOLER. EPR F8-1017	G.1 REPLACED HYDRAULIC LINE FROM CHECK VALVE TO ACCUMULATOR, EPR F9-1019	TUBE ASSY, METAL	STRAIGHTENED AND MELDED DOLLY WHEEL CYLINGER UPPER BRACKET AND REPLACED CYLINGER UPPER HOUNTING PIN. EPR F9-1020	H	INSTALL MANUAL AIR TANK OPAIN VALVE. AUTOMATIC DRAIN VALVE MAS MISSING AT OT II IMITIAL INSPECTION. EPR F8-1021	VALVE, MANUAL, AIR TANK DRAIN
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PACKING TO CORRECT LEAKING FITTING EPR F9-FRS501 PACKING, PREFORMED, USED WITH FITTING (REFER TO DEP 5-XXX-205-20 + P FIG. 31, SHT. 1, ITEM 47) ATTEMPTED TO TROUBLESHOOT PROBLEM INVOLVING FAILURE OF SCRAPER ORIVE TO OTSENGACE WHEN POWER SECTION WAS OTSENGACE WHEN POWER SECTION WAS STIFTED OUT OF 1 RST GEAR. TROUBLE DISAPPEARED WITHOUT CORRECTIVE ACTION BEING TAKEN. NOTE ALL THE EXPENDED WAS DIAGNOSTIC EPR F8-FFRS503 CIV.) REPLACED FITTING ON HOSE ASST FOUND TO BE LEAKING. ON HOSE ASST FOUND TO BE LEAKING. ACTION INTERRUPTED MISSION FOR 36 MINUTES EPR F8-FFRS505 INTERSECTIONAL PROPSHAFT AFTER ITEM HAD	00 00 00 00 00 00 00 00 00 00 00 00 00	000.00 I LIFE	3 Z 6 3	Y 2406 Y 2406 Y 2406	0 I H Y Y 0 0 A H Y Y 2	2 2 2	2 002.0 U O O A M Y Y 2 C 002.0 U O O I M Y Y 0
PACKING, PREFORMED 5-XXX-205-20 5-XXX-205-20 100.9 1 00.9 0RG. ATTEMPTINOLVII DISAPPE BEING TI DIAGNOS 01.2 2 00.0 0RG. FOUND TI MISSION 10.2 1 00.0 0RG. INTERSE		00.0	= 01 LIFE = 0016 1 00.0 00.9	Y 2406 00.0 00.6	0 I M Y Y 0801 00.0 00.9 0 A M Y Y 2406 00.0 00.6	U O O I H Y Y 0801 00.0 U O O A H Y Y 2406 00.0 U O O A H Y Y 2406 00.0	0 0025.0
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01.1 2 00.0 ORG. LEVEL MAINTENANCE PERFORMED QUARTERLY SCHEDULED MAINTENANCE ON PSECTION OF THE SCRAPER VEHICLE (250		7.00	0.00	N 0000 0000 N	0 A M Y N 0000 90.0	S 0 0 A M Y N 0000 00.0	0 0 A M Y N 8686 90.0
VENT ASSY, BREATHER, VENT ASSY, BREATHER,		=00228	*01 LIFE=00228	NO. 01 LIFE= 01			
00.6 1 00.0 ORG. LEVEL MAINTENANCE, (CIV) NO THAT MAC IS UNCLEAR ON PROPER LEVEL, REPLACED AIR ROTARY UNION WHICH MAD LOSSENEC AND FELL OUT OF THE SCRAPER ORIVE REDUCTION BOX. INCIDENT		9.00	0.00	0.00	0 1 G Y Y 0801 00.0	U O O I C Y Y 0861 06.0	0 0 1 C Y Y 0801 00.0

E P P P P P P P P P P P P P P P P P P P	PER OFIVE, (LOCATED ON NO ACTUATOR ASST.)	, INIL,) REPLACED FFRSS13 FR ON REMOTE AS INTERRUPTED E. EPR	ZAPER REMOTE CONTROL	(MIL,) REPLACED N REPLACED 81 RP BERING F ARICATED F AND N WOULD REFAIR OF RHED AT ORG.	PROPSHAFT ISCRAPER	. (MIL,) REPLACED FFR-5517 PURP AND ITS TUBE IS AN SEMBLY. ITS SEMBLY. ITS SEMBLY ALLOCATED BEAFR-5517
H DT  N AH  GE DESCRIPTION  1 00.7 HYDROSTATIC DRIVE ELECTRICAL CONTROL  RELAT BOX REPLACED WE ORG. LEVEL  HAINTERANGE. HILL.) HISSION WAS  INTERRUPTED FOR 51 HINUTES, INCLUDING  OF HAUTES OF DIAGNOSTIC TIPE EPR	BOX, ELECTRICAL CONTROL, SCRAPER OFIVE, (LOCATED ON DP OF HYDROSTATIC DRIVE PUMP AND ACTUATOR ASSY.)	I 00.0 ORG. LEVEL HAINTENANCE, (HIL.) REPLACED BONL CYLINDER CONTROL LEVE ON REMOTE CONTROL VALVE. HISSION WAS INTERRUPTED FOR 30 HINUTES, TOTAL ELAPSED TIME, HHILE CORRECTION WAS MADE. EPR	GF=052403899 NO=01 LIFE=00272 LEVER, CONTROL, BOWL (LOCATED ON SCRAPER RENGTE CONTROL VALVE. REFER TO DEP 5-XXXX-205-20 + P, FIG. 30, ITEM	SPIDER AND BEARING ASSY ON SPIDER AND BEARING ASSY ON INTERSECTIONAL PROPSHAFT REPLACED 81 HOURS EARLIER. THIS SPIDER/ BEARING ASSY HAD BEEN IMPROPERLY FABRCATED RESULTING IN LOSS OF LUBRICANT AND FAILURE. NOTE ACTION TAKEN HOULD PROBABLY BE CONSIDERED A REFAIR OF PROPSHAFT PROPERLY PERFORMED AT DRG.	GP=050900801 NO=01 LIFE=00081 SPIDER + BEARING ASSY INTERSECTIONAL PROPSHAFT (SCRAPER ORIVE)	01.1 1 00.0 ORG. LEVEL MAINTENANCE, (MIL,) REPLACED FFR-5517 TUBE BETWEEN HYOROSTATIC PURP AND ITS ACTUATOR, NOTE THAT THIS TUBE IS AN INTEGRAL PART OF THIS ASSEMBLY. ITS REPLACEMENT CONTUB BE CONSIDERED TO BE A REPLACEMENT COULD BE CONSIDERED TO BE A REPLACEMENT SUPPART. EPR FB-FFR-5517
1658 8	62 RELAY	1 000.1 1	72 LEVER	00.6	81 SPIDES 08	1 01.1
EH .94.6 CCD .CH OCL LCO NY CR KS KS	GP=050608000 NO=01 LIFE=00262 RELAY BOX, TOP OF	00.0	LIFE=0027	9.00	LIFE=000	00.0
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03705/79 HaIntenah 0 A T E	PARTS UNKNOWN	12/11/77	PARTS 2546665	15/11/77	PARTS 1	15/11/77

GP=052401HA1 NO=01 LIFF=00309 TUBE ASSY. (PART OF 2549194 PUMP AND ACTUATOR ASSY, SCRAPER OF 2549194 PUMP AND ACTUATOR ASSY, SCRAPER

CRETICALITY FACTOR: 1.00

PARTS NOTKNOWN

mesn	FFRS 51	TIPE SHOWN	FFRS52	CONTROL	FFRSS2	FFRS52	STATIC	FFRS52	
DESCRIPTION	REPLACED SLIP YOKE ASSEMBLY ON INTERNANCE, (CIV.,) REPLACED SLIP YOKE ASSEMBLY ON INTERSCITONAL PROPSHAFT, NOTE THIS SLIP YOKE WAS DEFECTIVE WHEN INSTALLED. THIS SLIP ITEM WAS INADVERTANTLY PICKED UP INSTEAD OF A GOOD SLIP YOKE THAT WAS AVAILABLE (SEE ACTION 6.0 OR FFRS509)	YOKE, SLIP, INTERSECTIONAL PROPSHAFT. (NOTE PART LIFE SHOWN IS TIME ITEM WAS ON THIS SCRAPER ITEM HAD PREVIOUS USE MHICH RESULTED IN ITS DAMAGE!	BROKE, IHEN REMOVED AND REPLACED THE EJECTOR CYLINDER CONTROL LEVER ROD. ACTION REQUIRED ONLY 4 MINUTES OF ACTIVE MAINTENANCE TIME EPR F9-FFRS525	CONTROL ROD, EJECTOR CYLINDER (ITEM PART OF REMOTE VALVE ASSY.)	REPLACED AIR ROTARY UNION ON SCRAPER DRIVE REDJCTION BOX, PART HAD LOOSENED, AND FELL OUT, REPEATING INCIDENT EXPERIENCED 162 HOURS EARLIER, REFER TO ACTION 7.0 OR FFR S510 EPR FB-FFRSSZ	REPLACED PREFORMED PACKING ON ORAIN PLUG LOCATED IN HYDROSTATIC ORIVE-PUMP AND ACTUATOR ASSEMBLY, EPR FB-FRS528	PACKING, PREFORMED (USED WITH DRAIN PLUG ON HYDROSTATIC DRIVE PUMP AND ACTUATOR ASSY.)	100.0 ORG. LEVEL MAINTENANCE, (CIV) INSTALLED A MODIFIED, (LONGER) SLIP YOKE ON SCRAPER INTERSECTIONAL PROPSHAFT ASSEMBLY, NO FAIRLUE, INVOLVED MITH THIS MAINTENANCE ACTION.	
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					DESCRIPTION	 00.0 ORG. LEVEL MAINTENANCE, (CIV.,) REPLACED/RETIGHTENED AIR ROTARY UNION WHICH HAD LOOSENED, AND FELL OUT, THIS	IS RECORRENCE OF INCIDENTS REPORTED IN SCIIOVS 7.0, AND 17.0, MITH GULT 46 HOURS SINSE LAST OCCURRENCE, EPR FB-FFRSS30	REPLACED HYDROSTATIC DRIVE HYDRAULIC HOTOR.	GP=052401431 NO=01 LIFE=00493 HOTOR ASSY. (SCRAPER HYDROSTATIC DRIVE)	00.0 0RS LEVEL HAINTENANCE PERFORMED QUARTERLY SCHEDULED HAINTENANCE ON WORK SECTION OF SCRAPER VEHICLE (500 HR)	BREATHER. REDUCTION BOX	BREATHER.	ELEMENT, FILTER (LOW PRESSURE)	GASKET (USED WITH ABOVE ITEM	CARTRIDGE, FILTER, (HIGH PRESSURE)	PACKING, PREFORMED (USED WITH ABOVE)	00.0 ORG LEVEL MAINTENANCE PERSONNEL ADJUSTED SCRAPER SECTION PARKING BRAKE	EPR F3-FF 2551A	00.0 DIRECT SUPPORT LEVEL HAINTENANCE REPLACED/REWELDED HANDLES ON APRON LOCK PIN ASSY. EPR F8-FRSS244	TICHTENED CUTTING EDGE BOLTS EPR	TIGHTENED HYDROSTATIC MOTOR DRAINPLUG. EPR F8-1022
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			DESCRIPTION	REPAIR REAR CLARK NAME PLATE EPR FB-1022	REMOUNT SAFETY PIN IN EJECTOR STORAGE	TIGHTENED HYDRAULIC HOSE AT PUMP. EPR F8-1022	TIGHTENEO FITTING LEFT BOWL LIFT CYLINJER. EPR F8-1022	COUPLED TO POWER SECTION T JO AT HMTR READING 1036.6. EPR F8-1121	PERFORMED 50 HOUR SERVICE. EPR F9-1122	REPLACE DEFECTIVE GREASE FITTING. EPR	GREASE	7.6 REPLACED HYDROSTATIC PUMP AND ACTUATOR. EPR F8-1126	HYDROSTATIC PUMP AND ACTUATOR ASST	REPLACED LUBRICATION FITTING. EPR	LUBRICATION FITTING	REPLACED PREFORMED PACKING IN THE HYDRAULIC LINE ON THE RIGHT SIDE OF THE HYDRASTATIC PUMP. EPR F8-1130	PREFORMED PACKING	USES A 10"X10" TIMBER TO STRAIGHTEN A BEND IN THE APRON. EPR FB-1131
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mean	1132	1133	11.54	1136		1138	1137 (5-1)	1140,1.		1139(5-1)		1141(1139-1)	And which with a rest was a second	1142		1143
OESCRIPTION	PERFORMED 50 HOUR SERVICE. EPR FB-1132	TIGHTENED HOSE ASSY CONNECTOR ON RJADSIDE OF SCRAPER AT APRON CYLINDER.	TIGHTENED LINE TO APRON LIFT CYLINDER. EPR F8-1134	REPLACED CUTTING EDGES. EPR FB-1136	EDGE, INNER EDGE, OUTER	HEATED AND STRAIGHTENED UPPER EJECTOR ASSY ROLLER TRACK, EPR FB-1138	GROUND WELDS AND REWELDED REAR SUPPORT BRACKETS. EPR F8-1137(S-1)	CONTROL VALVE. EPR FB-1140, -1.	SOLEMOID DETENT ASSY	REPLACES COMPOSITE LIGHT. EPR FB-1139(S-1)	POSITE	REPLACED COMPOSITE LIGHT. EPR FB-1141(1139-1)	POSITE	REPLACED GLADHAND. EPR F8-1142	HOSE EMERGENCY (GLAD HAND)	0.5 REPAIRED INSULATION ON COIL INSIDE SOLENDID DETENT ASSY. EPR FB-1143
AH HH AOT NO RE IT	2.4.3	0.1 1	0.1 1	2.0.2	CUTTING ED	0.6 3	2.0 1	4.5 1	SOLENOID D	0.5 1	LIGHT, COMPOSITE	0.5 1	LIGHT, COMPOSITE	0.1 1	COUPLING.	3.2 2
TEST , FAMECE1 TEST ITEM ,948 T S E F T Q A C G CD CH A A C C C A A H S R OL LO A S U H H ' T F P NY OU 'N K R S T CR	S C C A C Y N 0000	U C C A C Y N 0524 0.1	U C C A C Y N 2406 0000 0.1	S C C A C Y N 7448 1.0	GP= 057448 NO=01 LIFF= 057448 02	U F F A C Y Y 1501 0.2	U O O A C Y Y 1501 2.0	UFFACTY 2402 2.5	GP= 052402 NO=01 LIFE=	U 0 0 A C Y N 0608 0.5	GP= 050608 NO=01 LIFE=	U O O A C Y N 0608 0.5	GP= 050608 NO=01 LIFE=	U O O A C Y N 1208 0.1	GP= 051208 NO=01 LIFF=	U H H A C Y Y 2402 1.6
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w	. م	œ	s		1145		1148	1152	5N1	1155	1156	1159	1157			1170	
					0.1 REPLACED FRONT ROADSIDE FITTING ON THE HYDRASTATIC DRIVE PUMP. EPR F0-1145	HALE PIPE	50 HOUR SERVICE, NO FLUIDS OR LUBRICANTS ADDED, EPR F8-1148	0.2 REPLACED ROTATING AIR UNION. EPR F8-1152	ROTARY UNION, AIR, AT REAR OF SCRAPER ON CLUTCH HOUSING	PERFORMED SO HOUR SERVICE. EPR FB-1155	REVERSED CUTTING EDGES. FPR FB-1156	ADJUSTED SERVICE BRAKES. EPR FB-1159	9.1 REPLACED FAN ON ROADSIDE HYDRAULIC OIL COOLER., EPR F8-1157	FAN, HYDRAULIC OIL COOLER, REAR, ROADSIDE	RE-THREAD BROKEN EJECTOR CONTROL ROD. F8-1168	COMPLETED 250 HR MAINTENANCE EPR	
		CONTRACTOR SEC	DESCRIPTION		0.1 REPLACED F HYDRASTATIC	FITTING, HYDRAULIC JICZHALE PIPE	50 HOUR SE LUBRICANTS A	0.2 REPLACED R F8-1152	ION, AIR, AT R	PERFORMED	REVERSED C	ADJUSTED S	0.1 REPLACED FAN ON RO COOLER., EPR F8-1157	AULIC OIL COOL	RE-THREAD EP FB-1168	COMPLETED FB-1170	, BREATHER ARTRIDGE YORAULIC
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US/05/79 HAINTENANCE TASK LOG D S OHR A		4	-		14/11/78 1 831.7	PAFTS 15K-8	16/11/78 1 838.4	21/11/76 1 864.0	PARTS 2545660	29/11/78 1 884.0	29/11/78 1 664.0	29/11/78 1 684.0	30/11/78 1 884.0	PARTS 2548377	11/12/78 1 911.0	27/12/78 1 922.4 46.0	PARTS 569022-03 HC9600FUF HC9500SUJ
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CONTROL VALVE  OD.O ORG LEVEL MAINTENANCE, (CIV) REPLACED  POWER SECTION MIDHOUNT BEARING (NOTE  REPLACEMENT ITEM TAKEN SCRAPER
00.0 ORG LEVEL MAINTENANCE, (CIV) REP POWER SECTION MIDHOUNT BEARING (NO REPLACEMENT ITEM TAKEN FROM SCRAPE VEHICLE-ITEM HAD 448.0 HOURS OF USI
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OESSRIPTION	04.3 Z 00.0 ORG. LEVEL MAINTENAME PERFORMED QUARTERLY SCHEDULED MAINTENANCE, POWER SECTION, GRADER VEHICLE (250 HOUR) ELEHENT, ENGINE JIL FILTER, FULL FLOM GASKET (USED MITH ABOVE ITEM) ELEHENT, AIR CLEANER CARRINGE, FUEL FILTER GASKET (USED MITH ABOVE ITEM) VENTRIDGE, FUEL FILTER GASKET (USED MITH ABOVE ITEM) VENT ASSY, BREATHER, CONVERTER ELEMENT, MATER FILTER (CORROSION RESIST) VENT ASSY, BREATHER, CONVERTER PACKING, PERFORMED (USED MITH ABOVE)	REDUCER ASSOCIATED WITH AUTOMATIC DRAIN VALVE, NDTE DIAGNOSTIC TIME SHOWN ABOVE WAS USED BY OPERATION ALSO SPENT S MINUTES IN CHECKOUT. (TOTAL TIME AT 036 0.1500 * AND TOTAL TASK TIME 0.3167 EPR FB-FFRG515	MANCE REPLACE INTERPLACE INTERPLA	GF=011414A01 NO=02 LIF(=00361 VALVE, RELIEF, ROTARY MANIFOLO O D A C Y N 0609 00.0 00.1 00.1 1 00.0 ORG LEVEL MAINTENANCE REPLACED LAMP 23 COMPOSITE LIGHT, FOUND TO BE OUT DURING
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04FA	97712777 97712777 93167 93167 93167 93167 93167 93316 93316 93316 93316	12/12/77 PARTS 19F	14/12/77	PARTS 81317977 21/12/77 004

GP=010503937 NO=01 LIFE=00410 LAMP, INCANDESCENT, 24V

PARTS 6240-00-044-6914

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H 07	z		13.6 2 00.0 PERFORMED 500 HOUR MAINTENANCE EPR FB-840	FILTER ELEMENT, OIL, FULL FLOW	DGE, FUEL FILTE		-	ASSY, BREATHER, ASSY, BREATHER,	00.1 1 00.0 ADDED 1 GALLON TO HYDRAULIC RESERVOIR	00.1 1 00.0 ADDED 1 GALLON OF OIL TO ENGINE	01.0 2 00.5 REPLACED SOLENOID ON ELECTRIC CONTROL VALVE 1ST GEAR. EPR FB-843	SOLENDID, ELECTRIC CONTROL VALVE	01.0 2 00.0 REDJCE PRESSURE TO DOLLY WHEEL CYLINDERS AT RELIEF VALVE FROM 2700 PSI TO 2100 PSI EPR F0-657	0.1 1 REPLACED BROKEN HOLDBOARD CONTROL BOX FASTNER RECEPTACLE. EPR FB-1024	RECEPTICLE, TURN LOCK FASTNER	0.1 1 TIGHTENED DOLLY WHEEL GLOBE VALVE PACKING RETAINING NUT. EPR F8-1025	0.2 1 REPLACED BOLT RIGHT SIDE ENGINE PANEL EPR F9-1025	SCREW CAP HEX HEAD	0.2 1 STRAIGHTEN EMERGENCY DUMMY COUPLING EPR
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U F F I C T Y 74.35   00.0   02.1   02.5   2   00.0   018ECT SUPPORT LEWEL HAINTENANCE, RELECTED FOOD (2)   TILL LINK BACKETS ON TILL LINK BACKETS ON TILL LINK BACKETS ON TILL THE BACKETS ON TILL THE BACKETS ON TILL THE BACKETS ON CANABALIZED FROM V.P. CRADE FER PRESCRIPTION OF A C T Y 0801   00.0   01.4   01.4   1   00.1   080   00.0   01.4   01.4   1   00.1   080   00.0   01.4   01.4   1   00.1   080   00.0   01.4   01.4   00.1   00.0   01.5   00.0	N N OU NU		a v
GP=047435H16 NO=01 LIFF=00057 TILT LIMK 455F - MOLD BOARD  O A C Y Y 0001 00.0 01.4 01.4 1 00.1 0RG LEVEL MAINTENANCE, CIVIN REMOVED  GP=047435H16 NO=01 LIFF=00057 TILT LIMK 455Y - MOLD BOARD  O O A C Y Y 0001 00.0 01.4 01.4 1 00.1 0RG LEVEL MAINTENANCE, CIVIN REMOVED  REPLACES GRADER SECTION TRANSFER CASE  EPR 73-FF46595  GP=040001902 NO=91 LIFF=00100 BEARING A55Y - MOLD BOARD  O O A C Y Z 4 07 00.0 01.2 02.1 2 00.0 DIRECT SUPPORT PERSONNEL, 12  GP=040001902 NO=91 LIFF=00100 BEARING A55Y, 9ALL, FRANSFER CASE  GOODING SECTION TRANSFER CASE  GP=042407911 NO=01 LIFF=00247 CYLIMOGR A55Y, 9ALL, FRANSFER CASE  GP=042407911 NO=01 LIFF=00247 CYLIMOGR A55Y, 9ALDE HAINTENANCE (CIV  NO O A C Y Z 4 07 00.0 00.0 01.0 2 00.0 0RG LEVEL MAINTENANCE (CIV  REMOVED PREMICE OF TIME OF  FALIURE OF SCARFIFER PARTY AND WAS  REPLACED AT THE RADOR POIL-C ATTRE  S O O A C Y 7 7440 00.0 00.0 01.3 2 00.0 0RG LEVEL MAINTENANCE (CIV  REPLACED STATE ASSALTED SHAFT AND REPLACED ATTRE  S O O A C Y 7 7440 00.0 00.0 01.3 2 00.0 0RG LEVEL MAINTENANCE (CIV  REPLACED STATE ASSALTER SHAFT AND REPLACED ATTRE  S O O A C Y 7 7440 00.0 00.0 01.3 2 00.0 0RG LEVEL MAINTENANCE (CIV  REPLACED STATE ASSALTER SHAFT AND REPLACED MAIRE  S O O A C Y 7 7440 00.0 00.0 01.3 2 00.0 0RG LEVEL MAINTENANCE (CIV  REPLACED SHAFT AND REPLACED MAIRE  S O O A C Y 17440 00.0 00.0 01.3 2 00.0 0RG LEVEL MAINTENANCE (CIV  REPLACED SHAFT AND REPLACED MAINTENANCE, OF STATER  S O O A C Y 17440 00.0 00.0 00.0 0 0 0 0 0 0 0 0 0 0 0	SS.	NO	
GP=047435M16 MO=01 LIFE=00057 TILT LIMK ASSY - MOLD BOARD  U O O A C Y Y 0801 00.0 01.4 01.4 1 00.1 ORG LEVEL MAINTENANCE, (CIV) REMOVED  EPR F3-FF36505  UF F A C Y N 8801 00.0 01.2 02.1 2 00.0 DIRECT SUPPORT PERSONNEL, 12  CIVILIANS,) REPARED TRANSFER CASE  REMOVED IN ACTION 5.0 EPR F9-FF6505  GP=04001902 MO=91 LIFE=00100 BEARING ASSY, 9ALL, FRANSFER CASE  REMOVED IN ACTION 5.0 EPR F9-FF6505  GP=042407911 NO=01 LIFE=00247 CYLINGER ASSE INPUT SHAFT  U O O A C Y Z407 00.0 01.5 2.9 2 00.0 ORG LEVEL MAINTENANCE (CIV  REPOVED/REPLACED SCARFIER CASE  GF=042407911 NO=01 LIFE=00247 CYLINGER ASSY, BLADE LIFT, R.H.  U O O A C Y 7440 00.0 00.0 01.0 2 00.0 ORG LEVEL MAINTENANCE (CIV  REFLACED AT THE REPOVED AT THE OFF  FAILURE OF SCARFIER SHAFT, AND MASS  REPLACED AT THE ENDOR POT-C AFFER  SCARFIER SHAFT HAS REPLACED AT THE REPORT AFFER  IS TOTAL FITHE EX-PRINGE ASSY, BLADE LIFT, R.H.  IS TOTAL FITHE EX-PRINGE AS INFOR 250  HORR. OUTSTERN SHERED THE SHOWN HORE OF CORPERSONEL, (CIV) REPLACED HORR ASSONEL, (CIV) REPLACED HORR ASSONEL, (CIV) REPLACED HORR OFFER SHORED AT OPER FRANCEL CORPORATION HARMANCE.  ORG PERSONNEL, (CIV) REPLACED HORR OFFER SHORED AT OPER FRANCE.  ORG PERSONNEL, (CIV) REPLACED HORR OFFER STATES  ORG PERSONNELL STATES  ORG PERSONNEL STATES  ORG PERSONNEL STATES  ORG PERSON BELLO STATES  ORG PERSONNEL STATES  ORG PERSONNEL STATES  ORG PERSONNEL STATES  ORG PERSONNEL STATES  ORG PERSON BELLO STATES  ORG PERSON BELLO STATES  ORG PERSON BELLO STATES  ORG PERSON BELLO STATES  ORG PERSON BELLO STATES  ORG PERSON BELLO STATES  OR	00057 001.0A U F F I C Y 7435 00.0 02.1 02.5 2 00.		FFRGS02
GP=047435416 NO=01 LIFE=00057 TLT LINK ASST - NOLD BOARD  U O A C T Y 0801 00.0 01.4 01.4 1 00.1 ORG LEVEL MAINTENANCE, (CIV) REMOVED  REPLACED SRADER SECTION TRANSFER CASE  EPR F3-FF4C505  GP=040801902 NO=91 LIFE=00108 BEARING ASST, 9ALL, TRANSFER CASE  REHOVED IN ACTION 5.01 EPR F9-FF6C505  GP=042407911 NO=01 LIFE=00247 CYLINDER ASST, 9ALL, TRANSFER CASE INPUT SHAT  U O O A C Y 7440 00.0 00.8 01.0 2 00.0 ORG LEVEL MAINTENANCE, (I CIVILIANS,)  GF=042407911 NO=01 LIFE=00247 CYLINDER ASST, BLADE LIFT, R.H.  U O O A C Y 7440 00.0 00.8 01.0 2 00.0 ORG LEVEL MAINTENANCE (IIV BASE REPLACED SCARFIER CYLINDER, HOWER PRELACED SCARFIER CYLINDER, HOWER PRELACED STAFFIER CYLINDER, SCARFIER SHAFT, AND WAS REPLACED STAFFIER SHAFT, AND WAS REPLACED STAFFIER SHAFT, AND WAS REPLACED STAFFIER SHAFT, AND WAS SCARFIER SHAFT, AND WAS SCARFIER SHAFT AND SCARFIER SHAFT AND WAS SCARFIER SHAFT AND SCARFIER SHAFT AND WAS SCARFIER SHAFT AND SCARFIER SHAFT AND SCARFIER SHAFT AND SCARFIER SHAFT AND SCARFIER SHAFT AND SCARFIER SHAFT AND SCARFIER SHAFT AND SCARFIER SCHOOLED MAINTENANCE, ONC PERSONNEL, (CIV) REPLACED SCARFIER SHAFT AND SCAFFIER SHAFT AND SCAFFIER SHAFT AND SCAFFIER SHAFT SCHOOLED MAINTENANCE, ONC PERSONNEL, (CIV) REPLACED SCARFIER SHAFF SCAFFIER SHAFT AND SCAFFIER SHAFT SCHOOLED MAINTENANCE, ONC PERSONNEL, (CIV) RESPECTOR SCAFFIER SHAFF SCAFF			
U O O A C Y Y 0801 00.0 01.4 01.4 1 00.1 ORG LEVEL HAINTENANCE, (CIV) REMOVED REPLACED GRADER SECTION TRANSFER CASE EPR F3.FF 45.505  U F F A C Y H 9801 00.0 01.2 02.1 2 00.0 DIRECT SUPPORT PERSONNEL, 12 CIVILIANS,) REPAIRED TRANSFER CASE REMOVED IN ACTION 5.01 EPR F9.FFRG505  GP=040801902 NO=91 LIFF=C0100 BEARING ASSY, 9ALL, TRANSFER CASE REMOVED IN ACTION 5.01 EPR F9.FFRG505  U O O A C Y Y 24.07 00.0 01.5 2.9 2 00.0 ORG LEVEL HAINTENANCE, (I CIVILIANS,) REPLACED 3.1 INDER PROPERTIES CASE INDUT SHAFT  U O O A C Y 7 7440 00.0 01.5 2.9 2 00.0 ORG LEVEL HAINTENANCE (CIV NOER, NOTE 3.7 THOSE SHAFT, AND NAS REHOVED AT THE ENONE POTC AFTER SHAPT, AND NAS REHOVED AT THE ENONE POTC AFTER SHAPT, AND NAS REPLACED AT THE ENONE POTC AFTER SCANFIFER SHAFT, AND NAS REPLACED AT THE ENONE POTC AFTER SCANFIFER SHAFT, AND NAS REPLACED AT THE ENONE POTC AFTER SCANFIFER SHAFT, AND NAS REPLACED AT THE EX-PRODED AT THE ENONE POTC AFTER SCANFIFER SHAFT, AND NAS REPLACED MAINTENANCE, ONLY THE SALENCE OF THE SCANFIFER SHAFT, AND NAS REPLACED MAINTENANCE, ONLY THE SALEGES WERN NOTE, NLY THE SALEGES WERN NOTE ONLY THE SALEGES WERN NOTE ONLY THE SALEGES WERN		BOARD	
GP=040901902 NO=91 LIFE=00108 BEARING ASSY, BALL, IRANSFER CASE 040801902 NO=91 LIFE=0010 NO=91 N	U O O A C Y Y 0801 00.0 01.4 01.4 1	HAINTENANCE, (CIV) REHOVED ADER SECTION TRANSFER CASE 505	FFR3509
GP=040801902 NO=91 LIFE=C0100 BEARING ASSY, BALL, TRANSFER CASE INPUT SHAFT  U O O A C Y Y 2407 00.0 01.5 2.9 2 00.0 ORG LEVEL HAINTENANCE, (I CIVILIANS,)  GP=042407911 NO=01 LIFE=00247 CYLINDER ASSY, BLADE LIFT, R.H.  U O O A C Y 7440 00.0 00.0 01.0 2 00.0 ORG LEVEL HAINTENANCE (CIV  REHOVEOREPLACED SCARFIER CYLINDER,  REPLACED SCARFIER SHAFT, AND WAS  REPLACED AT THE ENDOR POT-C AFTER  SCARFIER SHAFT, AND WAS  REPLACED AT THE ENDOR POT-C AFTER  SCARFIER SHAFT, AND WAS  REPLACED AT THE SHOWN  IS TOTAL TIME EX-PENDED AT THE SHOWN  IS TOTAL TIME EX-PENDED AT OPG. LEVEL.  EPR F0-FRG513  S O O A C Y N 7435 00.0 00.9 01.3 2 00.0 WHILE GRADER VEHICLE WAS IN FOR 250  HOUR, DUARTERLY SCHEDULED MAINTENANCE,  ORG PERSONNEL, (CIV) REPLACED WORN HOLD  ORG PERSONNEL, (CIV) REPLACED WORN HOLD	UFFACY # 8861 00.0 01.2 02.1 2 DD.	REPAIRED TRANSFER CASE ACTION 5.01 EPR F9-FFRG505	FFR5509
GP=042407911 NO=01 LIFE=00247 CYLINDER ASSY, BLADE LIFT, R.H.  U O O A C Y 7440 00.0 00.8 01.0 2 00.0 ORG LEVEL MAINTENANCE (CIV REHOVED CORRECTER SHAFT, AND WAS REPOVED AT THE ENOS DAT TIME OF FAILURE OF SCARIFIER SHAFT, AND WAS REPOVED AT THE SHOWN IS TOTAL TIME EX-PROBED TIME SHOWN IS TOTAL TIME EX-PROBED AT THE SHOWN IS TOTAL TIME EX-PROBED AT THE SHOWN IS TOTAL TIME EX-PROBED AT THE SHOWN IS TOTAL TIME EX-PROBED AT OPG. LEVEL. EPR FB-FRG513  S O O A C Y N 7435 00.0 00.9 01.3 2 00.0 WHILE GRADER VEHICLE WAS IN FOR 250 HOUR, OURTERLY SCHEOULED MAINTENANCE, ORG PERSONNEL, (CIV) REPLACED WORN HOLD ORG PERSONNEL, (CIV) REPLACED WORN HOLD BOARD CUTTING EOGES. EPR FB-FFRG512.5	5-6355 GP=040801902 NO=91 LIFE=C0108 040801902 91 00106	ANSFER CASE	
GP=042407911 NO=01 LIFE=00247 CYLINDER ASSY, BLADE LIFT, R.H.  604.0 U O O A C Y 7440 00.0 00.8 01.0 2 00.0 ORG LEVEL HAINTENANCE ICIV REHOVEDREPLACEO SCARIFIER SHAFT, AND WAS REPLACED AT THE ENOOF POT-C AFTER SCARIFIER SHAFT, AND WAS REPLACED AT THE ENOOF POT-C AFTER SCARIFIER SHAFT, AND WAS REPLACED AT THE SHOWN IS TOTAL TIME EX-PENDED AT OPG. LEVEL. EPR F0-FRG513 HOUR, OUATTERS SCHECLE WAS IN FOR 250 HOUR, OUATTER SCHECLE WAS IN FOR 250 HOUR, OUATTER SCHECLE OF MAINTENANCE. ORG PRSSONNEL, ICIV) REPLACED WORN HOLD BOARD CUTTING EOGES. EPR F0-FRG512.5	U O O A C Y Y 2407 00.0 01.5 2.9 2	LINDER EPR FB-FFRGS12	FFR3512
606.0 U O O A C Y Y 7440 BD.8 DD.8 DI.D 2 DD.0 DRG LEVEL MAINTENANCE ICIV REMOVED/REPLACED SCARIFIER CYLINDER.  HOTE CYLINDERNAS REFOVED AT TIME OF FAILURE OF SCARIFIER SHAFT, AND WAS REPLACED AT THE ENDOR POT-C AFTER SCARIFIER SHAFT AND WAS REPLACED AT THE ENDOR POT-C AFTER SCARIFIER SHAFT AND WAS REPLACED AT THE SHOWN IS TOTAL TIME EX-PENDED AT OPG. LEVEL. EPR FB-FRG513  HOUS. D S O A C Y N 74.35 DO.0 DO.9 DI.3 Z DO.0 WHILE GRADER VEHICLE WAS IN FOR 250 HOUR. DUARTERLY SCHEDULED MAINTENANCE. DRG PERSONNEL, ICIV) REPLACED WORN HOLD BRACE PERFECTIVE BORN HOLD BRACE PERFECTIVE BORN HOLD BRACE PERFECTIVE BORN HOLD BRACE PERFECTIVE STAFF BORN HOLD BRACE PERFECTIVE		IFT. R.H.	
00260 005.0 S O O A G Y N 7435 00.0 00.9 01.3 Z 00.0 WHILE GRADER VEHICLE MAS IN FOR 250 HOUR, QUARTERLY SCHEDULED MAINTENANCE.  08G PERSONHEL, 1GIV) REPLACED WORN HOLD BOAGO CUTTING EDGES. EPR FB-FFRG512.5	504.5 U O O A C Y Y 7440 00.0 00.8 01.0 2 00.	HAINTENANCE ICIV LACED SCARIFIER CYLINDER. ERMAS REPOVED AT TIME OF SCARIFIER SHAFT, AND WAS THE ENDOF POT-C AFTER SHOWN HAFT WAS REPAIRED. TIME SHOWN HE EX-PENDED AT ORG. LEVEL.	1865
	00260 005.0 S O O A C Y N 7435 00.0 00.9 01.3 2 00.	DER VEHICLE MAS IN FOR 250 ERLY SCHEDULED MAINTENANCE. EL. (GIV) REPLACED WORN MOLD NG EDGES. EPR FB-FFR6512.5	FFR6512

GF=047435A99 NO=01 LIFF=00260 CUTTING EDGE, L.H. 047435A99 01 00260 CUTTING EDGE, R.H.

PARTS HS 35465-3 HS 35465-2

H 0000 00.0 01.6 01.9 2 00.0 ORG. LEVEL MAINTENANCE PERFORMED  QUENTERLY SCHEDULED MAINTENANCE ON MORK SECTION 0 5 GARGAE VHILLE (250 MR)  102 NO-01 LIFE=00260 VENT ASSEMBLY, BREATHER, TRANSFER CASE 53 00260 VENT ASSEMBLY, BREATHER, AZLE FRO 00.0 00.4 00.4 10.0 DIRECT SUPPORT MAINTENANCE FROSTA FRO 00.0 00.2 00.2 1 00.0 DIRECT SUPPORT MAINTENANCE FRO 00.0 00.2 00.2 1 00.0 DIRECT SUPPORT LEVEL MAINTENANCE FRO 00.0 00.3 00.3 1 00.0 DIRECT SUPPORT LEVEL MAINTENANCE FRO 00.0 00.0 00.2 00.0 DIRECT SUPPORT LEVEL MAINTENANCE FRO 00.0 00.0 00.2 1 00.0 DIRECT SUPPORT LEVEL MAINTENANCE FRO 00.0 00.0 00.2 1 00.0 DIRECT SUPPORT LEVEL MAINTENANCE FRO 00.0 00.0 00.0 DIRECT SUPPORT LEVEL MAINTENANCE FRO 00.0 00.0 00.0 DIRECT SUPPORT LEVEL MAINTENANCE FRESSON FRES	TEST ITEM ,9:0 C G CO CH MH H DT S R OL LO AO E IT F P NY OU NU N AM T CR R GE DESCRIPTION
11 LIFE=00260 VENT ASSEMBLY, BREATHER, TRANSFER CASE 00260 VENT ASSEMBLY, BREATHER, AXLE 000.0 00.4 00.4 1 00.0 DIRECT SUPPORT MAINTENANCE END TO ROD. EPR FB-FFRG514 END TO ROD. EPR FB-FFRG514 CYLINER HAD BEEN REPAIRED BY D.S. PERSONNEL EPR FB-FFRG514 00.0 00.3 00.3 1 00.0 DIRECT SUPPORT LEVEL MAINTENANGE REPLACEO/RENELDED 3ALL ON CIRCLE AND DRAMBAR ASSEMBLY EPR FB-FRG516 00.0 00.2 00.2 1 00.0 ORG. LEVEL MAINTENANCE RECONNECTED ROD BALL ON CIRCLE AND DRAMBAR ASST. AFTER THAT BALL HAD BEEN REPLACED BY D.S. EPR F3-FFG516 00.0 00.0 1 00.0 RRG LEVEL MAINTENANCE REPLACED LUBE EPR F3-FFG516 CYLINGER EPR FB-FFRG517 DILLFF=00341 FITTING LUBRICATION CO.0 00.3 00.3 1 00.0 DIRECT SUPPORT LEVEL MAINTENANCE BERLDGED CRACK IN WELD AT JUGTION OF BLADE LIFT CYLINDER TO CAPLINGER EPR FB-FFRG516 CYLINGER ENPERENT HELD AT JUGTION OF BLADE LIFT CYL ROD AND CYL CAP.IR.H.	01.6 01.9 2 00.0 ORG. LEVEL MAINTENANCE PERFORMED QUARTERLY SCHEDULED MAINTENANCE ON SECTION OF GRADER VEHICLE (250 HR)
00.0 00.4 00.4 1 00.0 DIRECT SUPPORT HAINTENANCE  REPAIREOBLADE LIFT CYL BY WELDING ROD  END TO ROD. EPR FB-FFRG514  END TO BLADE LIFT CYLINDER AFTER THAT  CYLINCER HAD BEEN REPAIRED BY D.S.  PERSONNEL EPR FB-FFRG514  00.0 00.3 00.3 1 00.0 DIRECT SUPPORT LEVEL MAINTENANCE  REPLACEO/REMELDED SALL ON CIRCLE AND  DRAWBAR ASSEMBLY EPR FB-FFRG516  00.0 00.2 00.2 1 00.0 DRG. LEVEL MAINTENANCE RECONNECTED ROD  END OF CIRCLE SIDE SHIFT CYLINDER TO  BALL ON CIRCLE SIDE SHIFT CYLINDER TO  BALL ON CIRCLE AND DRAWBAR ASSY. AFTER  THAT BALL HAD BEEN REPLACED LUBE  FITTING AT BOO END OF BLADE LIFT  CYLINDER EPR FB-FFRG517  D1 LIFF=00341 FITTING LUBRICATION  CO.0 00.3 00.3 1 00.0 DIRECT SUPPORT LEVEL MAINTENANCE  BEHLDED CRACK IN MELD AT JUSTION OF  GLADE LIFT CYL ROD AND CYL CAP.(R.H.	NO=01 LIFE=00260 VENT ASSEMBLY, BREATHER, TRANSFER CASE 53 00260 VENT ASSEMBLY, BREATHER, AXLE
00.0 00.2 10.0 0RG. LEVEL MAINTENANCE RECONNECTED RODEN END OF BLADE LIFT CYLINDER AFTER THAT CYLINDER HAD BEEN REPAIRED BY D.S. PERSONNEL EPR FB-FFRGS14.  00.0 00.3 10.0 DIRECT SUPPORT LEVEL MAINTENANCE REPAIRED BY D.S. BREPLACEO/REMELDED BALL ON CIRCLE AND DRAWBAR ASSEMBLY EPR FB-FFRGS16.  11 LIFE= 338 BALL, CIRCLE REVERSE MECHANISM BALL ON CIRCLE AND DRAWBAR ASSY. AFTER THAT BALL MAINTENANCE RECONNECTED RODEN OF CIRCLE AND DRAWBAR ASSY. AFTER THAT BALL MAD BEEN REPLACED BY D. S. EPR F3-FFRGS16.  10.0 00.0 00.0 1 00.0 RRG LEVEL MAINTENANCE REPLACED LUBE FITTING AT RODEN OF BLADE LIFT CYLINDER EPR F9-FFRGS17  11 LIFF=0034; FITTING LUBRIGATION  10.0 00.3 00.3 1 00.0 DIRECT SUPPORT LEVEL MAINTENANCE REFLOED CRACK IN WELD AT JUGTION OF BLADE LIFT CYL ROD AND CYL CAP. (R.H.	00.4 00.4 1 00.0 DIRECT SUPPORT MAINTENANCE REPAIREDBLADE LIFT CYL BY WELDING ROD END TO ROD. EPR FB-FFRG514
REPLACEOTRE LEVEL HAINTENANCE REPLACEOTRE WELDED BALL ON CIRCLE AND DRAWBAR ASSEMBLY EPR FB-FFRG516  DRAWBAR ASSEMBLY EPR FB-FFRG516  DRAWBAR ASSEMBLY EPR FB-FFRG516  DROUG CIRCLE REVERSE MECHANISM  BALL ON CIRCLE AND DRAWBAR ASST. AFTER THAT BALL AND DRAWBAR ASST. AFTER THAT BALL HAINTENANCE REPLACED LUBE FITTING AT ROO END OF BLADE LIFF  CYLINDER EPR FB-FFRG517  DI LIFF=D0341 FITTING LUBRICATION  REWELDED CRACK IN WELD AT JUGTION OF BLADE LIFT CYL ROD AND CYL CAP-FRG518  GTLINDER INVOLVED) EPR FB-FFRG518	00.2 00.2 1 00.0 ORG. LEVEL MAINTENANCE RECONNECTED ROD END OF BLADE LIFT CYLINDER AFTER THAT CYLINDER HAD BEEN REPAIRED BY D.S. PERSONNEL EPR FB-FRG514
00.0 00.2 00.2 1 00.0 ORG. LEVEL MAINTENANCE RECONNECTED ROD END OF CIRCLE SIDE SHIFT CYLINDER TO BEND OF CIRCLE AND DRAMBAR ASSY. AFTER THAT BALL HAD BEEN REPLACED BY D. S. EPR F3-FF4G516  00.0 00.0 10.0 RRG LEVEL MAINTENANCE REPLACED LUBE FITTING EVEL MAINTENANCE REPLACED LUBE CYLINDER EPR F8-FFRG517  01 LIFF=00341 FITTING LUBRICATION REWELDED CRACK IN WELD AT JUGTION OF BAADE LIFT CYL ROD AND CYL CAP. (R.H.	00.3 00.3 1 00.0 DIRECT SUPPORT LEVEL MAINTENANCE Replaceo/Rewelded 9all on Gircle and Drambar assembly epr fb-ffrg516
00.0 00.2 1 00.0 ORG. LEVEL MAINTENANCE RECONNECTED RODEN DE CIRCLE SIDE SHIFT CYLINDER TO BALL ON CIRCLE AND DRAMBAR ASSY. AFTER THAT BALL HAD BEEN REPLACED BY D. S. EPR F3-FF3G516  00.0 00.0 10.0 RRG LEVEL MAINTENANCE REPLACED LUBE FITTING AT ROD END OF 9LADE LIFT CYLINDER EPR F8-FFG517  11 LIFF=00341 FITTING LUBRICATION  00.0 00.3 00.3 1 00.0 DIRECT SUPPORT LEVEL MAINTENANCE REFLOED CRACK IN WELD AT JUGTION OF BLADE LIFT CYL ROD AND CYL CAP-(R.H. CYLINDER INVOLVED) EPR F8-FFG518	338 BALL.
00.0 00.0 00.0 1 00.0 RRG LEVEL MAINTENANCE REPLACED LUBE FITTING AT ROO END OF 9LADE LIFT CYLINDER EPR FB-FFRG517  11 LIFF=00341 FITTING LUBRICATION  00.0 00.3 00.3 1 00.0 DIRECT SUPPORT LEVEL MAINTENANCE REMELDED CRACK IN WELD AT JUCTION OF BLADE LIFT CYL ROD AND CYL CAP.IR.H.  CYLINDER INVOLVED) EPR FB-FFRG518	00.0 00.2 00.2 1 00.0 ORG. LEVEL MAINTENANCE RECONNECTED ROD END OF CIRCLE SIDE SHIFT CYLINDER TO BALL ON CIRCLE AND ORAMBAR ASSY. AFTER THAT BALL HAD BEEN REPLACED BY D. S. EPR F3-FF3GS16
01 LIFF=00351 FITTING LUBRICATION 00.0 00.3 00.3 1 00.0 DIRECT SUPPORT LEVEL MAINTENANCE REHELDED CRACK IN MELD AT JUCTION OF BLADE LIFT CYL ROD AND CYL CAP.(R.H. CYLINDER INVOLVED) EPR FB-FFRG518	00.0 00.0 1 00.0 RRG LEVEL MAINTENANCE REPLACED LUBE FITTING AT ROO ENU OF BLADE LIFT CYLINDER EPR F8-FFRG517
00.0 00.3 00.3 1 00.0 DIRECT SUPPORT LEVEL MAINTENANCE REWELDED CRACK IN WELD AT JUCTION OF BLADE LIFT CYL ROD AND CYL CAP. (R.H. CYLINDER INVOLVED) EPR FB-FFRG518	GP=047435999 NO=01 LIFF=00341 FITTING LUBRICATION
	00.3 00.3 1 00.0 DIRECT SUPPORT LEVEL MAINTENANCE REWELDED CRACK IN WELD AT JUCTION OF BLADE LIFT CYL ROD AND CYL CAP.(R.H. CYLINDER INVOLVED) EPR FB-FFR6518

waxn	FFR5518	FFRG518.		FFR3521	FFR6521	191		1107	692	913	
OT III AH GE OESCRIPTION	00.0 ORG LEVEL MAINTENANCE RECCHHECTED ROD END OF BLADE LIFT CYLINDER AFTER THAT CYL(R.H.) HAD BEEN REPAIRED BY DIRECT SUPPORT EPR FB-FFR510	00.0 OPG LEVEL MAINTENANCE REPLACED LUBE FITTING ON MOLOBOARD ASSEMBY (SIDE SHEET SLIJE) EPR FB-FFRG518.5	GP=047435999 NO=01 LIFF=00371 FITTING LUBRICATION, MOLDBOARD	00.0 ORG LEVEL PREPARED, AND CHECKOUT MOLUBOARD ASSY IN ASSOCIATION WITH 0.5. REPAIRS OF THAT ASSY - SEE ACTION 19.0A EPR FB-FFRG521	00.0 DIRECT SUPPORT HAINTENANCE REPAIRED HOLOBOARD WELDHENT BY REWELDING CRACKS FOUND DURING FINAL INSPECTION OF GRADER AT THE END OF PQT-C. EPR FO-FFR6521	DD.D REPLACED CUTTING EDGES ON GRADER WORK SECTION. PART LIFE NOT KNOWN SINCE GRADER WAS RECIEVED FROM CLARK EQUIPMENT CO WITH THE CUTTING EDGES ALREADY WORN DOWN. EFR FB-767	BIT-BOTTOM-RH BIT-BOTTOM-LH	00.0 PERFORMED 50 HOUR MAINTENANCE EPR FB-1107	01.0 CHESKED SERVICE BRAKE EPR FB-769	80.0 REPLACED TOP ELBOW ON HYDRAULIC Hanifold EPR F8-813	
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CH HH H DT LO AO E IT OU NU N AH CR GE DESCRIPTION	00.5 01.0 2 00.0 REPLACED LEFT AND RIGHT HAND BOTTOM BITS EPR FB-819 051.7 LEFT HAND BIT 051.7 RIGHT HAND BIT	00.2 00.2 1 00.0 INSTALLED RETROFIT KIT TO MANUALLY DISCONNECT MIDMOUNT BEARING. 2 WASHERS, 1-PIESE TUBING, 1-NUT. EPR FB-54.2	VENT ASS VENT ASS FILTER E	01.2 01.2 1 00.0 REMOVE SERVICE BRAKE FROM GRADER WORK SECTION BECAUSE THE BRAKE WAS SHOKING AND MOULD NOT RELEASE EPR FB-852 01.2 1 00.1 REPLACED ROTTOM STATE CONTRACTOR STATE	FB-845 4-6 LH BOTTOM BIT 4-6 RH BOTTOM BIT, MOLDBJA	CAPSCREW, HEX HEAD 5/8-11, 5 IN LG. TILT LINK CURSSIDE 10.4 2 00.8 REPAIRED TRANSFER CASE ASSENDLY E	UNK SHAFT, ASSY. DISS - SPRING - SIMP RING - HASHER THRUST - OIL SEMI
17ff , 950	435 00.0 00.5 NO=01 LIFE=051.7 01 051.7	0.00	11	0 0.00	00 0 00 00	NO=01 LIFE= UNK 0408 0112 05.0	LIFE
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9 <b>4</b> 0 <b>⊢</b> z	015.0	16.0	18.0	1.00	19.04		
TASK DOON OUD MRS	9.9	1 506.4	PARTS 569022-03 569022-03 AC43887 04/03/78 2 509.0	CRITICALITY FACTOR= 06/03/78 1 509.5	FARTS HS35465-3 HS35465-2 06/03/78 1 509.5 1	PARTS 17C-1080H 08/03/78 2 539.3 20.0 CRITICALITY FACTOR= 1.00	PARTS 2547066 2547152 5100-362 2547146 50936 25K-40616 415425

waan		116 NO :	JHT 1026		852(5-1)		1027		1027		1027		1027	
	DESCRIPTION BALL, ANLR BALL, ANLR	REWELDED TWO WELDS CONTAINING GRACKS ON CIRCLE WELDMENT. EPR F8-911	REMOVE, REPAIR, AND REINSTALL MIDMOUNT ASSEMBLY ON TRANSFER CASE, EPR FB-1026		INSTALLED DISK BRAKE ASSEMBLY. EPR F3-852(S-1)	9E.R	REPLACE BOLT ON CUTTING EDGE EPR FB-1027	4Ex	INSTALLED SCREW ON LOCK PLATE ON HYDRAULIC MANIFOLD COVER. EPR F9-1927		REPLACED LEVER BOOT ON CONTROL VALVE.		REPLACED LEVER 90CT ON CONTROL VALVE EFR F9-1027	
H 01 H AH GE		1	-	SEAL	•	BRAKE PAD BRACKET BRACKET		BOLT NUT PLAIN HEX	1	SCREW LOCKWASHER LOCKWUT		BOOT LEVER	1	
I Q 3 a	BEARING,	9.6	5.8	011 5	0.5		0.5	BOLT MUT P	0.1	SCREW LOCKWAS LOCKNUT	1.3.1	B00T	0.3	
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0 4 F B	3-1-20	27/33/78 1 544.6 21.0	C4ITICALITY FACTOR= 1.0 28/03/78 1 546.0 22.0	PARTS 519263	•	99-06750 99-06751 5285942 5207052		254,8609 630-10H		0E5365~584-1 0E5365~585-1 0E5365~546-1	0	PARTS H26X7		
	m m	3377	1CAU	15	28/03/78		28/03/78		28/03/78		30/03/78	15 4	30/03/78	
0413		12	28/	AR	187	PARTS	18	PARTS	182	PART3	30/	A	105	

mean	1027	1020	
DESCRIPTION	TIGHTENEO PILOT LINE FITTING EPR FB-1027	CRANKS. BUSHINGS EXCESSIVELY HORM. EPR F8-1028	
N N N N N N N N N N N N N N N N N N N			BELL CRANK
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ROIFF			57
D3/05/79 HAINTEMANCE TASK LOG N	30/03/78	30/03/78	PARTS 2545717 2545718
O T D A F W	~	m	۵

w a a v						989		989		687 (646-1)		869	688	(1-9191699	690(638-2)
		SIDE MIRRORS	RACK FRAME	E	OR BELTS		HOSE ASSY NM-EITTING JOOSLY LOCATED AT THO MAY VALVE		IL TO HYDRAULIC		GP=000012406 NO=01 LIFE=013.1 HOSE ASSY NM-FITTING-J905L4 LOCATED AT THO MAY VALVE		IC FLUID LOST	1	
71 10N	L ROPS	L (2) REAR VIEW SIDE MIRRORS	00.0 INSTALL WINOSHIELG ASSY 00.0 ASSEMBLE + INSTALL CAB RACK FRAME	00.0 INSTALL CANVAS DAB COVER	00.0 TIGHTEN LOOSE ALTERNATOR BELTS	00.1 REPLACED CONNECTOR ON HOSE ASSY-900 ELBOW, FLARE CRACKED EPR FB-696	G JOBSES LOCATED	2 GALLONS OE-10 TO HYDRAULIC R EPR FB-686	00.0 ADDED 1.5 GALLONS OF OIL TO HYDRAULIC TANK	00.1 REPLACE) CONNECTOR ON HOSE ASSY-900 ELBOM, FLARE CRACKED EPR F9-697(686-1)	G-J90SL4 LOCATED	00.0 TIGHTENED LOOSE HYD HOSE END FITTING EPR F8-608	O ADDED 7 QUARTS OF HYDRAUL BY LOOSE FITTING EPR FB-688	00.0 RETIGHTENED LOOSE HYD HOSE ASSY END FITTING EPR F8-689(688-1)	00.1 TIGHTENED FITTING ON HOSE CONNECTION. 2-WAY VALVE EPR F9-6901688-2)
E IT N AM GE DESCRIPTION	3 00.0 INSTALL ROPS	1			1		ASSY NM-FITTIN	1 00.1 ADDED 2 RESERVOIR	1 00.0 ADDED TANK	1 00.1 REPLAC	ASSY NH-FITTIN	1	1 00.0 ADDED BY LOOSE	1 00.0 RETIGH	
I Q D Q	02.1 3		01.6 2	01.6 4	2 4.00	1 000.3 1	HOSE	00.2 1	00.5	00.3	1 HOSE 1	00.3 1	00.3	00.3	00.1 1
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11 TEST ITEH ,951 A C G CO C H S R OL C T F P NY O	2	2		0000 z	N N 0601	M Y Y 2406	GP=000012406_NO=01_LIFE=	N Y N 0000	0000 X	Y Y 2406	2406 NO	Y Y 2406	0000 N A	Y Y 2406	0 0 A M Y Y 2406
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26 TEST	0 0.10	01.0A U	01.08 U	01.00 U	01.0E U	102.0 U	ST-9NSF	02.0A U	03.0 S	0.40	65-4NSF	0.50	U 80.20	0.90 U	0 0.70
S OHR A H DON C THES NOT THES NOT THES	106.9 0	108.0	108.9 0	108.9 0	108.9 0	113.3	0.242R4-	113.3 0	118.3	126.8 0	0.242R4-	128.2 0	128.2	120.00	130.7 0
AINTENANCE TASK LOG ON THE NON C T F OUD T	09/11/77 2 108.9 001.0	09/11/77 2 108.0 001.0A U	09/11/77 2 108.9 001.08 U	09/11/12 2 108.9 001.00 U	09/11/77 2 108.9 001.0E U	15/11/77 1 113.3 002.0 U	PARTS 56.50,242R4-JSN4-J9	15/11/77 1 113.3 002.0A U	15/11/77 2 118.3 003.0	16/11/77 1 126.6 004.0	PARTS 56.50,242R4-JSN4-J9	16/11/77 2 128.2 005.0	16/11/77 2 128.2 005.0A U	16/11/77 2 120.0 006.0	17/11/77 1 130.7 007.0

Meso	1		692			693	581	450	548		97.8	
	DESCRIPTION	DO.D ADDED 4 QUARTS ENGINE OIL	00.3 REPLACE DEFECTIVE NEUTRAL SOLENDID EPA	760.0		00.0 PERFORMED 50 HOUR MAINTENANCE EPR F8-693	00.1 APPLIED HOT AIR TO PARKING BRAKE ACTUATOR VALVE TO THAN IGE MHICH MAS PREVENTING PARKING BRAKE FRCM RELEASING. EPR FB-501	00.0 PERFORMED SO HOUR MAINTENANCE EPR FB-450	THROUGH CABLE INSULATION, HOUD HAS CUT THROUGH CABLE INSULATION, HOVED BATTERY CABLES SO THEY MOULD LINE UP MITH CUT OUT IN HOOD, EPR F8-548	00.0 ADDED 3 GAL. OF HYDRAULIC FLUID.	PERFORMED 250 HR. MAINTENANCE PER LUBE Order LO5-3640-201-12 EPR FB-973	FILTER ELEMENT, DIL, FULL FLOW FILTER ELEMENT, DIL, BYPASS CARTRIDGE, FUEL FILTER FILTER ELEMENT, DIL, TRANSMISSION FILTER ELEMENT, MATER, CORROSION RESIST FILTER ELEMENT, FL, POWER CLUSTER VENT ASSY, BREATHER, MOMT VENT ASSY, BREATHER, TRANSMISSION
N AN CE			-	1	NO 10	2		2	-	-	-	ER ELE RIDGE, ER ELE ASSY, ASSY,
HODE		00.1 1	01.8		GP=000010710 NO=01 LIFE=152.3 SOLENDIO	9.00	1 2.00	8.00	00.5	1.00	6.9	FILTER ELEG FILTER ELEG CARTRIDGE, CARTRIDGE, FILTER ELEG FILTER ELEG VENT ASSY, VENT ASSY,
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									_		863			_		£94			LOWER FRONT FUEL TANK BRACKET.			E AND	REPLACED BULB IN DASH LIGHT. EPR F8-998 Em 1	
						110	E OIL.	1C 01L	SSION OF	710	FITTING EPR		110	SS I CN OI	110	FENANCE	11C 01L	10 01	JEL TANK		8-1109	CAB FRAME	LIGHT. E	
						ENGINE	F ENGIN	HYDRAUL	TRANSHI	ENGINE			ENGINE	TRANSHI	ENGINE	UR HAIN	HYDRAU	HYDRAUL	FRONT F		. EPR F		N DASH	
				11 ON		GALLONS	GALS. 0	QUARTS	GALLON	GALLON	CRACKE		GALLON	DUARTS	QUARTS	0 50 HO	GALLONS	GALLON			50 HOUR SERVICE. EPR F8-1109		BULB I	
				DESCRIPTION		00.0 ADDED 2 GALLONS ENGINE OIL	00.0 ADDED 2 GALS. OF ENGINE	00.0 ADDED 2 QUARTS HYDRAULIC OIL	00.0 ADDED 1 GALLON TRANSMISSION OIL	88.8 ADDED 1 GALLON ENGINE OIL	00.0 REPLACED CRACKED HOSE F8-790 (686-2)	w	DO.D ADDED 1 GALLON ENGINE DIL	00.0 ADDED 2 DUARTS TRANSMISSION OIL	00.0 ADDED 2 QUARTS ENGINE DIL	00.0 PERFORMED SO HOUR MAINTENANCE EPR F8-806	88.8 ADDED 2 GALLONS HYDRAULIC OIL	00.0 ADDED 1 GALLON HYDRAULIC OIL	00.1 REWELDED	EPR 19-853	50 HOUR	00.0 REHOVED ROPS, CANVA.	REPLACE	
	10	11	AH	S.				1			i	GP=000012406 NO=01 LIFE=204.8 CONNECTOR,HOSE				1			1	1		00		LAMP, INCAND.
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-w a a	0	986		949		996		996	996		986	986		986	986	988
	DESCRIPTION	REPLACED BLACKOUT HEADLIGHT EPR F8-988	вгаскоит	REPLACED SEALED BEAM IN HEADLIGHT. ITEM 2. EP? FB-848,988	ВЕАМ	REPLACED OIL PRESSURE SMITCH. EPR F8-988 ITEM 4	SHITCH, PRESSURE	PUSH PETAINING RING BACK INTO LOCK POSITION. EPR F8-988 ITEM 5	REPLACED MISSING BOLT AND MJT ON LEFT Side panel Item 6 EPR FB-988	SCREW, CAP, HEX HEAD WASHER, FLAT	CLEANED + WASHED BATTERY BOX. EPR FB-988	REPLACED MASTER DISCONNECT SWITCH. EPR	SMITCH	TIGHTENED CLAMPS ON EXHAUST PIPE. EPR FB-985 ITEM 9	TIGHTENED CLAMP ON TURBOCHARGER DIL Supply Line. ITEM 10 EPR F8-988	TIGHTENED HOSE FITTING ON STEERING CYLINDER ON RIGHT SIDE ITEM 11 CPR
	w .		HE ADL IGHT,		LAMP, SEAL		, PRE			CAP,			DISCONNECT			
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		۵	~	S	- 1	988	988		988		986	988
					DESCRIPTION	STRAIGHTENED HYDRAULIC ACCUMULATOR. COVER. ITEM 12 EPR F8-988	INSTALLED COTTER PIN ON PINTLE HOOK		REPLACED AIR INTAKE FILTER. ITEM 14 EPR 988 F8-988	FILTER, ELEMENT, AIR, OUTER FILTER, ELEMENT, AIR, INNER	TIGHTENED TUBE FITTING ON THE EMERGENCY 938 GROUND STEERING PUMP, ITEM 15 EPR F8-988	TAPED AND RE-ROUTED BATTERY CABLES. EPR 988 F8-988
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51 1	v	œ	۵			027.0K U O O A Y N 2408	027.0L U C C A Y N 1503	*0×	027.0M U C C A Y N 0304	NO.	904	N N 0612
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03/05/79 HAINTEHAN	D S OHR A	A	-	, J	-	17/04/78	17/04/78	PARTS 770	17/34/78	PAKTS P11-7437	17/04/78 412.0 027.0M U O O H Y Y 2406	17/04/78

	w a.	œ va	651		169		693	634 (631-1)		56.9	
		E DESCRIPTION	00.1 ROLLER DRIVE ACTUATOR SHITCH LOCKED IN NO-50 POSITION BY MUD LODGED BETWEEN SMITCH ACTUATOR ARM AND SMITCH BODY. REMOVED MUD. EPR FB-651	ROLLER DRIVER ACTUATOR SWITCH ROLLER LIFT CYLINDER	00.0 INSTALLED 4 EACH; PLATES, PLOW BOLTS, 4 NUTS IN FRONT CLEANER BAR ASSY EPR FB-691		88.8 PERFORMED SO HOUR MAINTENANCE EPR F8-693	00.0 INSTALLED 8 PLATES IN THE PEAR CLEANER BAR ASST EPR F8-694(691-1)		00.0 DDJFY + INSTALL 16 CLEANER PLATES-10NEW PLATES + 8 OLD PLATES), PLATES WERE CUT TO A MIDTH OF 3.3 INCHES, ERR F9-695	
	H 01	2 2 3	1	ER 0	1	w.			PLATE ROLT WASHER FLAT NUT	1	PLATE BOLT WASHER FLAT NUT
	NO H	2 &	00.2 1	ROLL	01.0 2	PLAT 90LT	2 4.60	01.4 2	PLAT ROLT WASH NUT	02.9 1	PLATE BOLT WASHE
.952	10	388	2.00	FE=	0 00.5	NO=04 LIFF=134.6 PLATE 04 134.6 BOLT 04 134.6 NUT	2.00 0	2.00 0	GP=000077470 NO=00 LIFE=162.6 PLATE 000077470 16 162.6 POLT 000077470 16 162.6 MASHE 000077470 16 162.6 MUT	0 02.8	GP=000077470 NO=08 LIFF=167.2 000077470 16 167.2 000077470 16 167.2
		- 2		GP=000070508 NO=01 LIFE=	0.00	333	0.00	0.00	16 LJ	00.00	16 L1 16 L1
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TASK		M. S.	1		134	127	16	162	H H H	167	125 H
U3/05/79 MAINTENANCE	SI	-	-	¥	~	2545902 6514527 170-6	2	~	PARTS 2545902 6514527 25E18H 170-3H	2	PARTS 2545902 6514527 25618H 170-3H
S AN			111	5	111		111	111	12002	111	2002
03/05/79 MAINTENA			1	PARTS UNK	=	PARTS	115	/12	RTS	115	213
03/	04		15	PA	28	A	20	89	A	6	A A

285

10/12/77 1 168.0 006.0 U O C A H Y Y 74.70 00.0 00.8 DD.6 1 00.2 PLATES .005E OH CLEANER BAR ASSEMBLY.
REHOVE ALL PLATES TO PREVENT LOSS OF
PLATES AND DAMAGE TO CLEANER BAR.
ASSEMBLY EPR F8-562

waan	583	054	864	973		909	900	918	1103	946	193,9	
OT IIT A H GE DESCRIPTION	00.2 ICE IN THE AIR LINES PREVENTING GRAKES FROM RELEASING. VEHICLE MOVED INTO BUILDING HOT AIR APPLIED TO THAM ICE EPR F9-503	00.0 PERFORMED SO HOUR MAINTENANCE EPR F8-450	00.1 REPLACED CAM VALVE, TF ORUM DRIVE EPR F8-438	GF=000070900 NO=01 LIFE=00UNK CAH VALVE, TF ORUM LIFT CYLINDER O O A H Y N 0000 1.2 2.0 1 PERFORMED 250 HR, MAINTENANCE PER LUBE OROER LO5-3840-207-12 EPR F8-973	VENT ASSY, BREATHER, MIDMOUNT VENT ASSY, BREATHER, AXLE FILTER ELEMENT, FL, POWER CLUSTER	00.0 REPLACED LAMP IN CURBSIDE TAILLIGHT EPR F8-805	LAMP,INCANDESCENT 00.6 2 00.0 PERFORMED 50 HOUR MAINTENANCE EPR F8-806	00.0 REPLACED PARKING LIGHT LAMP EPR F8-818	LAMP, INCANDESCENT 0.4 1 50 HOUR SERVICE. EPR FB-1109	RETHREAD AND REINSTALL DRUM CONTROL VALVE ROD EPR F8-946	REPLACED PARKING BRAKE CARLE. EPR FB-793,947	CABLE, PARKING BRAKE
DH40		~	1	ALV	A SS	1	INC 2	-	I INC	-	2	•
IODA	03.0 1	00.00	00.5 1	2.0	VENT ASSY, VENT ASSY, FILTER ELEP	00.2 1	00.6	00.1 1	0.4 1	0.5 1	6.9	CABLE
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TASK LOG TEST OHR A T S E OGN C A / G OUD T S U H HES N K	1.00	7.0 S C C A	0.0	008.1 5		9.0 U C C A	9.04 S	010.0 0	10.1 5	412.0 011.0A U O O	412.0 011.09 U O O	
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	WO.	DO.O DRAINED WATER FROM COOLING SYSTEM REFILLED MITH 15 GAL. ANTIFREIZE EPR F8-698	00.2 PARKED VEHICLE IN HEATED AREA TO THAN OUT SYSTEMS EPR F8-523	DEFECTIVE HYDRAULIC PRESSURE F8-750		00.0 PERFORMED SO HOUR MAINTEHANCE ADDED 1/2 PINT BRAKE FLUID ADDED 22.4 ML OIL TO HIDHOUNT BEARING ASSEM. EPR FE-460		00.0 ADDED 6 QUARTS OF HYDRAULIC DIL	00.0 REPLACED CAP SCREW, LOCK MASHER, AND FLAT MASHER IN ACCUMULATOR COVER EPR F8-514		00.0 PERFORMED SO HOUR MAINTENANCE ADDED 6 ML OIL TO MIDMOUNT BEARING EPR FB-529		00.0 ADDED 2 QTS OF ENGINE OIL.	00.0 ADDED 4 QUARTS OF ENGINE CIL	88.8 ADDED ONE QUART OF HYDRAULIC OIL
	DESCRIPTION	ORAINED WREFILLED WI	.2 PARKED VE OUT SYSTEMS	00.0 REPLACE DEFECT VALVE EPR F8-750	GP=000012406 NO=01 LIFF=09611 VALVE, PRESS. ROC/RLV	O PERFORMED PINT BRAKE MIDMOUNT BE	00000 BRAKE FLUID, 1/2 PINT 00000 OIL, HIDHOUNT, 22.4 ML	. O ADDED 6 C	FLAT MASHER	*=	.0 PERFORMED HL OIL TO H	UNT (6 ML)	.0 ADDEO 2 0	.0 400E0 4 0	. O ADDED ONE
	5 F F G	88	00	8	PRES	90	LUI			CAP LOCK	00	040	00	8	00
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	145K 000 000 1485	:	10/12/77 1 082.0		PARTS 1P011-F6T-65		1		06/01/78 2 142.4		:		:	.5	23/02/78 2 190.5
	1 000 T	07/12/77 2 064.6	290	12/12/77 2 096.1	- 6	860		05/01/78 2 137.0	142	PARTS 17C-616H 24E-6H 25E-17H	09/01/78 1 150.1		22/02/78 2 180.1	23/02/78 2 190.5	130
	MNIFF	~	-	~	111	-		2	~	997	-		2	~	~
0	HAINTENANCE DO NA NA NA NA NA NA NA NA NA NA NA NA NA	11	11	11	10	11	1	18	2	24E-6H 25E-6H 25E-17H	2		7.8	18	18
03/05/19	ž	12	12	12	1	12	in	1	1	v	1	5	12	12	12
02	2	5	1	7	FF	1,	PARTS	2/0	9	4	0/6	PARTS	0/2	200	2
3	404FJ	0	10	1	P	5	0	2	9	0	5	0		-	2

Mean	187	:	795	769	-				8 09		828	829		637	
H DT E IT N AH GE DESCRIPTION	1 00.4 REPLACE DEFECTIVE SOLENDIO FOR 1ST GEAR EPR F9-781	010	2 DO.O PERFORMED 50 HOUR MAINTENANCE ADDED 2 QUARTS TRANSMISSION OIL ADDED 2 QUARTS ENGINE DIL EPR F8-792	1 00.0 REPLACED PIN IN DUST COVER ASSEMBLY HANDLE EPR F8-789		1 00.0 ADDED 1 GALLON OIL TO ENGINE	1 00.0 ADDED 1 GALLON OIL TO ENGINE	1 00.1 ADDED 2 GALLONS OF FLUID TO HYDRAULIC	1 00.0 REPLACED AXLE STOP AND PIN EPR F9-809	STOP QUICK RELEASE	1 00.0 RE TIGHTEN FAN BELTS EPR FR-828	1 00.0 REMOVED AND REPLACED BROKEN PRESSURE SENDER EPR F0-829	URE SENDER	2 00.0 CONDUCTED 250 HOUR MAINTENAUGE - UNCOUPLE 2 HEN 7 MINS, ADDED 12 02 LUBRICANTO HIDHOUNT BEARING 6 0TS OF LUBRICANT DIFFERENTIAL, 32 GTS OF ENGINE OIL CLEAN TRANS, BREFHER, CLEAN GRANGASE BREATHER REHOVE AND REPLACE	FILTER ELEMENT, 314, FULL FLOM
A N U O II	01.1 1	SOLENC	01.4 2	00.3	PIN	00.1	00.1 1	00.1 1	00.3 1	AXLE S	01.4	6.00	PRESSURE	05.5	FILTER
TEST , FAMECE1 TEST 11EH , 953 T S F E T Q A C G CD CH HI A / C C M A M S R OL LO AC S U H H T F P NY OU NY K R S T KS	U O O A M Y Y 0710 00.0 01.1	GP=000010710 NO=01 LIFF=190.9	S C C A H Y N 0000 00.0 00.7	U O O I M Y N 2406 00.0 00.3	GP=000012406 NO=01 LIFE=UNK F	U C C A M N N 0000 00.0 00.1	U C C A M N N 0000 00.0 00.1	U C C A M N N 0000 00.0 00.1	U O O A M N N 1100 00.0 00.3	GP=000011100 NO=01 LIFF= 0	U O O A M Y Y 0505 00.0 01.4	U O O A M N 0106 00.0 00.9	GP=000010106 NO=01 LIFE= P	S O O A M Y M 0000 00.0 04.4	GF=003010106 NO=02 LIFE=
03/05/79  HAINTENANCE TASK LOG  U S OHR A  A H DCN C  I F OUD I  E T HRS N	23/02/78 2 190.9 009.0 CRITICALITY FACTOR= 1.00	PARTS 236402	24/02/76 2 202.6 010.0	24/02/78 2 203.0 011.00	PARTS N/A	25/02/78 2 214.2 012.0	01/03/78 1 243.6 013.0	01/03/78 1 243.6 013.0A	01/33/78 1 246.0 014.0	PARTS 2546303 2546295	27/02/78 2 228.7 015.0 CRITICALITY FACTOR= 1.00	26/02/78 2 239.3 016.0	PARTS 5654312	04/03/78 257.5 017.0	PARTS MS-55802-3

			1108	920	971	97.1	176	116	1 971	116 .		176	97.1	696
	ION	OIL, BYPASS FILTER JIL, TRANSHISSION MATER, CORROSION RESIST FL, POWER CLUSTER HER, MUHT HER, AXLE HER, TRANSHISSION	50 HOUR SERVICE. EPR FB-1108	CRACK ON ENGINE STARTING AID SRACKET EPR F8-920	REPLACEJ FLOOD LAMP EPR F8-971 ITEM 1	REINSTALLED HANDLE ON GLOBE VALVE, LLY WHEEL SHUT OFF, EPR F0-971 ITEM 2	CLEANED AND SERVICED BATTERIES AND BATTERY BOX. EPR FB-971	REINSTALLED MIRRORS. EPR F8-971 ITEM 4	TIGHTENED VALVE COVER BOLTS EPR FB-971 EH 5	O SEALED BEAM ON SERVICE LIGHT.		TIGHTENEO FITTINGS AT SPEEDOHETER SENDING UNIT. EPR F9-971 ITEH 7	TIGHTENED FITTING AT LOCK UP SENDING UNIT. EFR FB-971 ITEM 8	REPLACED FUEL PUMP. EPR F8-969
	DESCRIPTION		50 HOUR	00.0 HELDED HOUNTING	REPLACE	REINSTALLE DOLLY WHEEL	CLEANE D	RE INSTA	TIGHTEN ITEM 5	REPLACED EPR F8-971		SENDING U	TIGHTEN UNIT. EFR	REPLACE
	N N N N N N N N N N N N N N N N N N N	FILTER ELEMENT, CARTRIOGE, FUEL FILTER ELEMENT, FILTER ELEMENT, FILTER ELEMENT, VENT ASSY, BREA VENT ASSY, BREA	2.0.2	0.1 1 0	0.1 1	0.1 1	0.1 1	0.4 1	0.3 1	0.1 1	LAMP	0.1.1	9.1 1	7.0 1
96.3	142		1.0	00.0	0.1	0.1	0.1	4.0	0.3	0.1		0.1	1.0	7.0
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-	- 40X		17.1 5 6 (	8.0 0 0	) o n e . 6	9.0A U C C	19.08 0 0	019.00 U O	19.00 0 0	19.0E U C	GP	0 0	0 0	0
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03/US/79 MAINTENANCE		9311 5678 LF-511 299080 AC43887 569022-03 569022-03	15/03/78 2 297.6	27/03/78 1 339.5		19/04/78	19/04/78	19/04/78	19/04/78	82/50/61	PARTS 4880	19/04/78	19/04/78	19/04/78 342.0 019.0H

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							the term of the second property of the second secon	RE-ROUTED BATTERY CABLES. EPR FB-971		The same of the sa
						DESCRIPTION		RE-ROUTED BATTE	TIGHTENED BATTERY SHITCH. EPR F3-971	
				NU NAM	R GE		-	0.1 0.1 1		
	.953					KS		0.1	0.1 0.11	
	CE1 TEST ITEM	QAC G CD	AMS R OL	T SUHT TF P NY OU	-			N N 0612	N N 0612	
	TEST , FAME	TSEET	AICCH	SUHT	X X			19.01 U O O A N N 0612	19.0JUCCA NN 0612	
	TASK LOG	OHE A	DON C	1 000	MRS N		-	342.0 1	342.0 1	
63/05/19	MAINTENANCE	0	A	T F OUD	£ 1			19/04/78	19/0//18	

MORN	164	460	664	664	205	503	000	204	MER		972	529	
DESCRIPTION	00.1 REWELD CURBSIDE SPRING STRAP EPR F8-491	00.0 PERFORMED 50 HOUR MAINTENANCE EPR FB-460	00.1 REMOVFO TIRE SCRAPER ASSEMBLY. EPR FB-499	00.0 REHELDED LOCK ARH EXTENSION ON TIRE SCRAPER ASSY EPR F8-499	00.0 REWELDEJ CURBSIDE SPRING STRAP EPR FB-502(491-1)	00.1 REPLACED CAP SCREW, MASHEPS, AND NUT IN CURBSIDE_STRUT_CONNECTION TO DRUM FRAME_EPR F8-503	SCREW CAP, HEX HEAD 3/4-10 4 1/2 IN LG NUT, SELF LOCKING HEXAGON 3/4-10 UNC WASHER, FLAT 3/4 IN 10, 1 1/8 IN OD CURBSIDE STRUT, HOOD ASSY	00.1 REPLACED CAP SCREM, WASHERS, NUT IN CURBSIDE CLEANER SPRING EPR F9-504	SCREW, CAP, HEX HEAD, 1/2-13 WASHER, FLAT 5/16 ID 2 3/4 OF NUT, SLFLKS, HEXAGON 1/2-13 CLEANER SPRING, DRUM CLEANER	00.1 ADDED 2 GALLONS OF HYDRAULIC FLUID	MANUALLY PLAGED TIRE SCRAFERS BACK INTO POSITION. EPR FG-972	DO.O PERFORMED 50 HOUR MAINTENANCE ADJED 1/2 PINT BRAKE FLUID EPR F8-529	BRAKE FLUID (1/2 PINT)
OF HIT	00	00	00	00	00.	00	AP, LF, L	00	CAP, FLA FLKS	00	i	.00	1010
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E A Z	2.00	9.00	00.5	00.3	00.5	00.2	SCRE NUT,	00.2 1	SCRE WASH NUT,	99.5	0.1	01.6 3	BRAK
* 53958	2.00	00.3	00.2	00.3	00.5	00.2	NO=01 LIFF= UNK 01 UNK 03 UNK	00.5	NO=01 LIFE= UNK 02 UNK 01 UNK	2.00	0.1	8.00	
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03/05/79 MAINTENANGE D S A H T F E	-	1 2		-	8		50-		22-09				
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MAINTENA MAINTENA D A T E	112	115	0.1	101	10.	101	213	101	ZTS	.01	101	10.	PARTS
A P D A L P	2	12	3	3	9	9	4	9	A	9	9	3	A

	iu.	<b>a</b> (	r sa		468(5-1)		742	768	784		79.2	917		917		637		1108	512 (5-1)
	10		30	DESCRIPTION	DD.D REPLACED SHEAR PIN IN HAND WINCH PARKING BRAKE EPR F8-468(S-1)	ROLL PIN HAND WINCH, PARKING BRAKE	DD.D RETHREADED AND REINSTALLED BALLAST CONTROL ROD EPR F8-742	00.0 REMOVED FOUR TIRE SCRAPER ASSEMBLIES OFF THE REAR TIRES, EPR F9-768	00.0 REPLACE BROKEN HAND WINCH PIN IN PARKING BRAKE EPR F8-784	PIN, HAND WINCH	00.0 PERFORMED SO HOUR MAINTENANCE, ADDED 1/2 PINT SRAKE FLUID EPR FB-792	GO.O REPLACED CAP SCREWS AND NUTS IN CLEANER BLADES EPR FB-817	CAP AGON	DD.D REPLACED CAP SCREWS, NUTS, AND WASHERS IN CLEANER BLADES EPR F9-817	CAP AGON FLAT	00.2 250 HOUR MAINTENANCE ADDED 1 PINT BRAKE FLUID TO MS HASTER CYLINDER. EPR F9-937	ELEMENT, FL, POWER GLUSTER	50 HOUR SERVICE. EPR FB-1108	00.0 REWELDED CRACKS ON VIDRATCRY HOOD ASSEMBLY. EPR FR-512(5-1)
		<b>.</b>			-	MId	-	-	-	HAN	2	4	S.	-	SHEX.	-	w	2	
		AO			00.1	ROLL	00.3	01.0	000.3	PIN.	01.0	2.00	SCREWS, CAP	2.00	SCREWS, CAP NUT, HEXAGON WASHER, FLAT	5.00	FILTER	4.0	1.2
6.		070		2	00.0 00.1	NO=01 LIFE= UNK	0.0 00.3	0.0 01.0	00.0 00.3	=000061201 NO=01 LIFE=015.3	5.00 0.00	2.00 0.00	NO=03 LIFF= 03	00.0 00.5	NO=03 LIFF=010.0 03 010.0	5.00 0.00	IFÉ=	0.2	1.2
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TEST I	ی	<b>a</b> : (			1201	NO=0	2403	7470	1201	NO	0000	N 7470		7 7470		0000 N	GP=000061204 NO=01 LIFE=	0000	N 7469
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, FAMECE 1	0 A	4			z	GP=000061201	5	-	F	190	-	×	GP=000067470	*	=000067470 000067470 000067470	-	190	E	0
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03/05/79					0/	PARTS	0	3/0	2/0	TX	70	?	PARTS	2	- X	?	18	9/8	2
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MAINTENANCE TASK LOG	TASK	106	165		FAH	IE CE	-	153	176	FAME GET TEST ITEM .954	,					
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24/03/78 1 359.6 015.0	339.	6 015.		0	0	r	>	090	6	0.0	U O O A M Y N 0609 00.0 00.1	00.1 1	-	10.0 REPLACED INCANU LIGHT. EPR F8-903	00.0 REPLACED INCANDESCENT LAMP, BRAKE LIGHT. EPR F0-903	506
PARTS HS35478-1683	478-11	583		3	00=	900	090	9 NG	10=	GP=000050509 NO=01 LIFE=		LAMP	-	CANDESCENT, COMPOSI	LAMP, INCANDESCENT, COMPOSITE REAR LIGHT, ROADSIDE	
24/03/78 1 339.6 015.0A	339.	6 015.	0 A C	0	0	U	-	U 0 0 A C Y N 7470		0.00	9.00	01.0 2	~	10.0 REWELDED EXTEN	00.0 REMELDED EXTENSIONS TO SCRAPER LOCKING ARMS EPR F8-908	906
24/03/78 1 339.6 015.08 U F F A C Y Y 1810	339.	5 015.	98	L.	4	O	-	181		0.00	00.3	00.3 1	-	BALLAST BOX, TOP CYLINDER 200 ENG F8-903	00.0 RCHELD DAMAGED MELDS AT FRONT OF BALLAST 80x, TOP GENTER EACH SIDE DUMP CYLINDER 20D END PIN CONNECTION. EPR F8-903	606
27/03/78 1 339.6 16.0	339.	91 9		0	0	0	-	U 0 0 A C Y Y 0000		00.0	0.1	0.1 1	-	00.0 REWELDED LEAF SPRING CLAMP. EPR F8-918(491-2)	SPRING CLAMP. EPR	918 (49 1-2
27/03/78 1 339.5 16.04	339.	5 16.	0 A U	0	0	0	-	U 0 0 A C Y Y 0615 06.0	5	0.0	0.1	0.1 1	-	10.0 WELDED WATER 1 F8-919	00.0 WELDED WATER TANK MOUNTING BRACKET. EPR F8-913	616
82/40/61	340.	340.0 017.0		U C C A	O		z	N N 7470			0.1	9.1 1	-	FB-949	FIGHTENED BOLTS ON DRUM CLEANER. EPR-943	646
82750761	340.	346.0 017.04 U 0 0	0 40	0	0		-	7 Y 1811	1		6.5	0.5	-	WELDED CRACK I	WELDED CRACK IN RIGHT WATER TANK UNTING BRACKET EPR F8-950	056
19/14/74 1 340.0 17.08 U C C A M Y N 0609	340.	0 17.	080	S	v	r	-	090	6		0.1	0.1 1		REPLACED TAILL	REPLACEO TAILLIGHT DOOR (LENS). EPR -788(S-1)	788 (5-1)
PARTS 11639535	3838			3	= 00	900	060	9 NO	= 01	CP=000060609 NO=01 LIFC=	"	9000	AS	DOOR ASSY, TAILLIGHT	to the control of the control of the control of the section of the section of the control of the	

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21/11/77 2 029.5 001.0 S 0 0 A M Y N 0000 00.0 00.7 02.1 3 00.0 INSTALLED ROPS EPR FB-753	753
PARTS 2545700 GP=000011801 NO=01 LIFF=00000 ROLL-OVER PROTECTIVE STRUCTURE	
28/11/77 2 029.5 001.04 S O O A M N N 0000 00.0 00.2 00.4 2 00.0 INSTALLED MINOSHIELD ASSY. EPR F3-753	153
26/11/77 2 029.5 001.08 S O O A M H H BOOD 00.0 01.0 03.0 3 00.0 INSTALL CAB FRAME AND CANVAS COVER EP? FB-753	153
02/12/77 1 035.5 002.0 U.C.C.A.H.Y N 0000 00.0 00.2 00.2 1 00.1 ADDED 3 GALLON HYDRAULIC FLUID 10E-101	
03/12/77 2 037.1 003.0 U O O A C Y Y 2406 00.0 00.3 00.3 1 00.0 REMOVED BROKEN HOSE FITTING GLANGE. MADE NEW FLANGE + INSTALLED HOSE + FITTING TO BY PASS VALVE EPR F8-754	754
05/12/77 1 039.3 004.0 U O O A M N N 2406 00.0 00.1 00.1 1 00.0 REPLACED 9ROKEN HYDRAULIC HOSE FITTING TO 2-MAY VALVE EPR F8-7551754-11	155 (754-1)
PARTS J905L4 GF=000012406 NO=01 LIFF=039-3 FITTING, HOSE	
03/12/77 2 039.3 004.14 U C C A H N N 0000 00.0 00.2 00.2 1 00.0 ADDED 2 QUARTS OF TRANSHISSION OIL	
06/12/77 1 048.8 005.0 U 0 0 A M Y Y 1418 00.0 01.7 03.4 2 00.0 REPLACED STEERING VALVE ASSEMBLY EPR	756
CRITICALITY FACTOR= 1.00	
PARTS HSB40011 GP=000011410 NO=01 LIFE=UNK VALVE,STERRING	
06/12/77 1 050.0 006.0 U C C A M N N 0000 00.0 00.1 00.1 1 00.0 ADDED 2 075. TRANSMISSION OIL	
86/12/77 1 950.0 006.04 U C C A M N N 0000 60.0 00.1 00.1 1 00.0 ADDED 1 GAL. HYDRAULIC OIL	
08/12/77 1 056.7 097.0 S C C A M Y N 0000 00.0 00.9 01.8 Z 00.0 PERFORMED 50 MOUR MAINTENANCE ADO 1 QUART OIL TO MIOMOUNT BEARING EPR	909
09/12/77 1 064.1 008.0 U F O A M Y Y 1414 00.0 00.1 00.1 1 00.0 REPLACED SEAL KIT IN STEERING VALVE Assembly earthd: 1.00	757 (756-1)
CRITICALITY FACTOR= 1.00	

W	4	œ	S							164	465		-	485	585		565
					00.0 ADDED 1 GALLON HYDRAULIC OIL	00.0 ADDED 1 GAL. OF ENGINE DIL	00.0 ADDED 1 GAL. OF HYDRAULIC FLUID.	. ADDED 2 QTS OF COOLANT TO THE SURGE TANK.	00.1 ADDED 1 GALLON HYDRAUC FLUID TO RESERVIOR	00.4 RECONNECTED LODSE CURBSIDE SERVICE HEADLIGHT TERMINAL CONNECTION EPR FB-493	00.1 ADDED 3 GALLONS HYDRAULIC OIL EPR F9-465	00.0 ADDED 1/2 GALLON FLUID (OE-10) TO Hydrajlic reservior.	DO. O ADDED 2 QUARTS HYDRAULIC CIL	MICHOUNT BEARING25 MR, 3 MEN TO UNCOUPLE .50 MR, 3 MEN TO UNCOUPLE .50 MR, 3 MEN TO PERFORM MAINTENANCE AND RECOUPLE 50 HOUR MAINTENANCE. EPR FB-465	00.0 REHOVED BROKEN ADAPTOR FROM THE AUTOMATIC RESERVOIR DRAIN VALVE EPR		00,0 REINSTALLED AND TIGHTEN NUT ON THE BOTTOM OF THE HIRROR HEAD, NUT HAD VIBRATED OFF EPR FR-595
			3	1			1	_	1		1			1		0.8	
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		DESCRIPTION	a company of the comp	TIGHTENED FITTING AT VARIABLE DISPLACEMENT PUMP EPR F9-974 ITEM #1	TIGHTENED COUPLING ON HYDRAULIC MANIFOLD EPR FB-974 ITEM 2	TIGHTENED HYDRAULIC LINE FITTING AT ACCUMULATOR. EPR FB-974 ITEH 3	REMOUNTED CLAMPS ON EXHAUST PIPE EPR	TIGHTENED TURBOCHARGER MOUNTING BRACKET BOLTS EPR F8-974 ITEM 5	TIGHTENED BATTERY CABLE BOLTS. EPR F8-974 ITEM 6	TIGHTENED FITTING ON OIL SUPPLY LINE AT TURBOCHARGER EPR FB-974 ITEM ?	REPLACE LEFT BRAKE LIGHT BULB. EPR FB-974 ITEM 8	LAMP INCANDESCENT	REPLACED BULB TORQUE CONVERTOR LOCK-UP INDICATOR EPR FB-974 ITEM 9	LAMP INCANDESCENT, TORQUE CONV. LOCK-UP	REPLACED MASTER SMITCH HANDLE. EPR F8-974 ITEM 10	ТСИ	REPLACED BOLT IN CANVAS CAS FRAME EPR F8-974 ITEM 11	SCREW CAP 5/16-18 UND. / IN LG.
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	OCSCRIPTION	REPLACED BOLT MINDSHIELD MOUNTING Bracket. Epr FB-974 ITEM 12		TIGHTENEO EXHAUST PIPE CLAMPS AT TURBOCHARGER AND MUFFLER. EPR FB-974 ITEM 13	CLEANED PAINT OFF AIRCLEANER INDICATOR. PAINTED OVER WHEN SPOT PAINTED. EPR FB-974 ITEM 14	TIGHTENED HYDRAULIC FITTING AT MANIFOLD EPR FB-974 ITEM 15	RETAPED MAIN WIRING HARNESS, EPR FB-974 ITEM 16	TIGHTENEO SENDING UNIT IN TRANSMISSION EPR F9-974 ITEM 17	TIGHTENED ELECTRICAL CONNECTIONS ON FUEL SHUTJOHN VALVE EFR FB-974	0.2 REPLACED SPEEDOMETER PULSE GENERATOR. EPR F0-978	GENERATOR ASSY	0.2 REPLACED LEAKING FUEL PUMP EPR FB-981	THE REPORT OF THE PROPERTY OF	DRIVERS WINDSHIELG WIPER ASSY REPLACED WITH WIPER ASSY FROM PASSENGEK WINDSHIELD EPR FB-979
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DO.D PERFORMED 50 HOUR MAINTANCE EPR FB-508	00.0 TURNED LEFT AND RIGHT HAND CUTTING EDGES EFR F8-756	00.0 FABRICATED AND REPLACED THE STEEL LINE ON HYDROSTATIC PUMP 3 TIMES. REPLACED STEEL LINE WITH A HOSE EPR F8-467	DRAULIC	00.0 REPLACED LEFT AND RIGHT HAND CUTTING EDGES EPR F8-509		00.0 ADDED 15 GALLONS HYDRAULIC FLUID TO SCRAPER HYDRAULIC RESERVIOR.	00.1 REPLACEO FAULTY ROADSIDE TAIL LIGHT LAMP EPR F8-494	ICANDESCENT ROADSIDE COMPOSITE LIGH	00.0 REPLACED CAPSCREM IN HYDRAULIC PUMP ASSEMBLY EPR F8-464	P 1/4 INCH	00.0 RECONNECTED HOSE ON HYDRAULIC PUNP ACTUATOR EPR F8-465	04.0 HYDRAULIC PUMP ACTUATOR ADJUSTMENT SCREM ADJJSTED. EPR F8-400	00.0 SOHR, I MAN TO REMOVE ORIVE SHAFT .25HR, 3 MEN TO UNCOUPLE .50HR,3 MEN TO PERFORM MAINTENANCE AND RECOUPLE 50 HOUR MAINTENANCE. EPR FB-485
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	A M Y N 0000 00.0 00.8 01.6 2 00.0 PERFORMED 50 HOUR MAINTANCE EPR F8-508	001.0 S C C A H Y N 0000 00.0 00.8 01.6 2 00.0 PERFORMED 50 HOUR MAINTANCE EPR FB-508 U C C A H Y N 7448 00.0 00.3 00.6 2 00.0 TURNED LEFT AND RIGHT HAND CUTTING EDGES EPR FB-758	001.0 S C C A M Y M 0000 00.0 00.8 01.6 Z 00.0 PERFORMED 50 HOUR MAINTANCE EPR FB-508 002.0 U C C A M Y M 7448 00.0 00.3 00.6 Z 00.0 TURNED LEFT AND RIGHT HAND CUTTING 003.0 U O O I M Y Y 2406 00.0 08.3 08.3 1 00.0 FABRICATED AND REPLACED THE STEEL LINE 00 HYDROSTATIC PUMP 3 TIMES. REPLACED STEEL LINE MITH A HOSE EPR F8-467	01.0 S C C A H Y H 0000 00.0 00.8 01.6 Z 00.0 PERFORMED 50 HOUR HAINTANCE EPR FB-508 02.0 U C C A H Y N 7448 00.0 00.3 00.6 Z 00.0 TURNED LEFT AND RIGHT HAND CUTTING EDGES EFR FB-758 03.0 U O O I H Y Y 2406 00.0 08.3 08.3 1 00.0 FABRICATED AND REPLACED THE STEEL LINE ON HYDROSTATIC PUHP 3 TIMES. REPLACED STEEL LINE MITH A HOSE EPR F8-467 GP=000052406 NO=01 LIFE=UHK HOSE, HYDRAULIC	01.0 S C C A H Y N 0000 00.0 00.8 01.6 Z 00.0 PERFORMED 50 HOUR MAINTANCE EPR FB-508 02.0 U C C A H Y N 7448 00.0 00.3 00.6 Z 00.0 TURNED LEFT AND RIGHT HAND CUTTING EDGES EFR FB-758 03.0 U O O I H Y Y 2406 00.0 08.3 08.3 1 00.0 FABRICATED AND REPLACED THE STEEL LINE 0.50 0.50 GP=000052406 NO=01 LIFE=UNK HOSE, HYDRAULIC EDGES EPR FB-509 EDGES EPR FB-509	01.0 S C C A H Y N 0000 00.0 00.8 01.6 Z 00.0 PERFORMED SO HOUR HAINTANCE EPR FB-508 02.0 U C C A H Y N 7448 00.0 00.3 00.6 Z 00.0 TURNED LEFT AND RIGHT HAND CUTTING EDGES EFR FB-758 03.0 U O O I H Y Y 2406 00.0 08.3 08.3 1 00.0 FABRICATED AND REPLACED THE STEEL LINE ON HYDROSTATIC PUHP 3 TIMES. REPLACED STEEL LINE MITH A HOSE EPR FB-467 0.50 GP=000052406 NO=01 LIFE=UNK HOSE, HYDRAULIC GP=000057448 NO=02 LIFE=UNK END BITS	01.0 S C C A H Y H 0000 00.0 00.8 01.6 Z 00.0 PERFORMED 50 HOUR MAINTANCE EPR F8-508 02.0 U C C A H Y N 7448 00.0 00.3 00.6 Z 00.0 TURNED LEFT AND RIGHT HAND CUTTING EDGES EFR F8-756 03.0 U O O I M Y Y 2406 00.0 08.3 08.3 1 00.0 FABRIDATED AND REPLACED THE STEEL LINE ON HYDROSTATIC PUMP 3 TIMES. REPLACED 0.50  GP=000052406 NO=01 LIFF=UHK HOSE, HYDRAULIC  GP=000057446 NO=02 LIFF=UHK END BIIS  GP=000057446 NO=02 LIFF=UHK END BIIS  GP=000057446 NO=02 LIFF=UHK END BIIS  SCRAPER HYDRAULIC RESERVIOR.	01.0 S C C A H Y H 0000 00.0 00.8 01.6 Z 00.0 PERFORMED 50 HOUR MAINTANCE EPR FB-508 02.0 U C C A H Y H 0000 00.0 00.3 00.6 Z 00.0 TURNED LEFT AND RIGHT HAND CUTTING E0GES EFR FB-758 03.0 U O O I H Y Y 24.06 00.0 00.3 00.3 1 00.0 FARRICATED AND REPLACED THE STEEL LINE 0.5 0 0.5 0 0.5 0 0.5 0 0.5 0 A H Y H 74.48 00.0 00.5 01.0 Z 00.0 REPLACED LEFT AND RIGHT HAND CUTTING EP-000057448 NO=02 LIFE-UNK END BITS  GP=000057448 NO=02 LIFE-UNK END BITS  GP=000057448 NO 00.0 00.2 00.2 I 00.0 REPLACED FAULTY ROADSIDE TAIL LIGHT 06.0 U C C A H Y H 0609 00.0 00.2 00.2 I 00.1 REPLACED FAULTY ROADSIDE TAIL LIGHT LAMP EPR FB-594	01.0 S C C A H Y H 0000 00.0 00.8 01.6 Z 00.0 PERFORMED 50 HOUR HAINTANCE EPR FB-508 02.0 U C C A H Y H 7448 00.0 00.3 00.6 Z 00.0 TURNED LEFT AND RIGHT HAND CUTTING 03.0 U O O I H Y Y 2406 00.0 00.3 1 00.6 FABRICATED AND REPLACED THE STEEL LINE 04.5 GP=000052406 NO=01 LIFF=UNK HOSE, HYDRAULIC 04.0 S O O A H Y N 7448 00.0 00.5 01.0 Z 00.0 REPLACED LEFT AND RIGHT HAND CUTTING GP=000057446 NO=02 LIFE=UNK END BITS  GP=000057446 NO=02 LIFE=UNK END BITS  GP=000057446 NO=02 LIFE=UNK END BITS  GP=000057446 NO=02 LIFE=UNK END BITS  GP=000057446 NO=02 LIFE=UNK END BITS  GP=000057446 NO=02 LIFE=UNK END BITS  GP=000057446 NO=02 LIFE=UNK END BITS  GP=000057446 NO=02 LIFE=UNK END BITS  GP=000057446 NO=02 LIFE=UNK END BITS  GP=000057446 NO=02 LIFE=UNK END BITS  GP=000057446 NO=02 LIFE=UNK END BITS  GP=000057446 NO=02 LIFE=UNK END BITS  GP=000057446 NO=02 LIFE=UNK END BITS  GP=000057446 NO=02 LIFE=UNK END BITS  GP=000057446 NO=02 LIFE=UNK END BITS  GP=000057446 NO=02 LIFE=UNK END BITS  GP=000057446 NO=02 LIFE=UNK LAMP, INCANDESCENT ROADSIDE COMPOSITE LIGH	01-0 S C C A H Y H 0000 00-0 00-8 01-6 Z 00-0 PERFORMED 50 HOUR HAINTANCE EPR FB-508 02-0 U C C A H Y H 7448 00-0 00-3 00-6 Z 00-0 TURNED LEFT AND RIGHT HAND CUTTING 03-0 U C C A H Y H 7448 00-0 08-3 08-3 1 00-0 FABRICATED AND REPLACED THE STEEL LINE 05-0 U C C A H Y H 7448 00-0 08-3 08-3 1 00-0 FABRICATED AND REPLACED THE STEEL LINE 05-0 U C C A H Y H 7448 00-0 00-5 01-0 Z 00-0 REPLACED LEFT AND RIGHT HAND CUTTING 05-0 U C C A H H N 0000 00-0 00-2 00-2 1 00-0 REPLACED FAULTY ROADSIDE TAIL LIGHT 06-0 U C C A H H N 0000 00-0 00-2 00-2 1 00-1 REPLACED FAULTY ROADSIDE TAIL LIGHT 07-0 U C C A H Y Y 2401 00-0 00-2 00-2 1 00-0 REPLACED CAPPORTE LIGH 07-0 U H O A H Y Y 2401 00-0 00-2 00-2 1 00-0 REPLACED CAPPORTE LIGH 07-0 U H O A H Y Y 2401 00-0 00-2 00-2 1 00-0 REPLACED CAPPORTE LIGH 07-0 U H O A H Y Y 2401 00-0 00-2 00-2 1 00-0 REPLACED CAPPORTE LICH 07-0 U H O A H Y Y 2401 00-0 00-2 00-2 1 00-0 REPLACED CAPPORTE LICH 07-0 U H O A H Y Y 2401 00-0 00-2 00-2 1 00-0 REPLACED CAPPORTE LICH 07-0 U H O A H Y Y 2401 00-0 00-2 00-2 1 00-0 REPLACED CAPPORTE LICH 07-0 U H O A H Y Y 2401 00-0 00-2 00-2 1 00-0 REPLACED CAPPORTE LICH 07-0 U H O A H Y Y 2401 00-0 00-2 00-2 1 00-0 REPLACED CAPPORTE LICH 07-0 U H O A H Y Y 2401 00-0 00-2 00-2 1 00-0 REPLACED CAPPORTE LICH 07-0 U H O A H Y Y 2401 00-0 00-2 00-2 1 00-0 REPLACED CAPPORTE LICH 07-0 U H O A H Y Y 2401 00-0 00-2 00-2 1 00-0 REPLACED CAPPORTE LICH 07-0 U H O A H Y Y 2401 00-0 00-2 00-2 1 00-0 REPLACED CAPPORTE LICH 07-0 U H O A H Y Y 2401 00-0 00-2 00-2 1 00-0 REPLACED CAPPORTE LICH 07-0 U H O A H Y Y 2401 00-0 00-2 00-2 1 00-0 REPLACED CAPPORTE LICH 07-0 U H O A H Y Y 2401 00-0 00-2 00-2 1 00-0 REPLACED CAPPORTE LICH 07-0 U H O A H Y Y 2401 00-0 00-0 00-0 00-0 00-0 00-0 00-0 0	01.0 S C C A H Y N 7448 00.0 00.8 01.6 Z 00.0 PERFORMED 50 HOUR MAINTANCE EPR FB-508 02.0 U C C A H Y N 7448 00.0 00.3 00.6 Z 00.0 TURNED LEFT AND RIGHT HAND CUTTING 03.0 U O O I H Y Y 2406 00.0 00.3 00.3 1 00.0 FABRICATED AND REPLACED THE STEEL LINE 00 H YDROSTATIC PUMP 3 TIMES. REPLACED 0.50  GP=000055406 NO=01 LIFF=UNK	01.0 S C C A H Y N 0000 00.0 00.3 00.6 Z 00.0 PERFORMED 50 HOUR MAINTANCE EPR F8-508 02.0 U C C A H Y N 7448 00.0 00.3 00.6 Z 00.0 TURNED LEFT AND RIGHT HAND CUTTING 03.0 U O O I H Y V 2406 00.0 08.3 08.3 1 00.0 FABRICATED AND REPLACED THE STEEL LINE 04.0 S O O A H Y N 7448 00.0 00.5 01.0 Z 00.0 REPLACED LEFT AND RIGHT HAND CUTTING 05.0 U C C A H N 0000 00.0 00.2 00.2 1 00.0 REPLACED LEFT AND RIGHT HAND CUTTING 06.0 U C C A H N 0000 00.0 00.2 00.2 1 00.0 REPLACED FAULTY ROADSIDE TAIL LIGHT 07.0 U H O A H Y Y 2401 00.0 00.2 00.2 1 00.0 REPLACED CAPSCREW IN HYDRAULIC PUHP 07.0 U H O A H Y Y 2401 00.0 00.2 00.2 1 00.0 REPLACED CAPSCREW IN HYDRAULIC PUHP 07.0 U H O A H Y Y 2401 00.0 00.2 00.2 1 00.0 REPLACED CAPSCREW IN HYDRAULIC PUHP 07.0 U H O A H Y Y 2401 00.0 00.2 00.2 1 00.0 REPLACED CAPSCREW IN HYDRAULIC PUHP 07.0 U H O A H Y Y 2401 00.0 00.2 00.2 1 00.0 REPLACED CAPSCREW IN HYDRAULIC PUHP 07.0 U H O A H Y Y 2401 00.0 00.2 00.2 1 00.0 REPLACED CAPSCREW IN HYDRAULIC PUHP 07.0 U H O A H Y Y 2401 00.0 00.2 00.2 1 00.0 REPLACED CAPSCREW IN HYDRAULIC PUHP 07.0 U O O A H Y Y 2401 00.0 00.2 00.2 1 00.0 RECONNECTED HOSE ON HYDRAULIC PUHP 07.0 U O O A H Y Y 2401 00.0 00.2 00.2 1 00.0 RECONNECTED HOSE ON HYDRAULIC PUHP	01.0 S C C A H Y H 0000 00.0 00.6 01.6 Z 00.0 TURNED LEFT AND RIGHT HAND CUTTING 02.0 U C C A H Y H 7448 00.0 00.3 00.6 Z 00.0 TURNED LEFT AND RIGHT HAND CUTTING 03.0 U O O I H Y Y Z406 00.0 08.3 08.3 1 00.0 TURNED LEFT AND RIGHT HAND CUTTING 05.0 U C O A H Y N 7448 00.0 00.5 01.0 Z 00.0 REPLACED LEFT AND RIGHT HAND CUTTING 05.0 U C C A H N N 7448 00.0 00.5 01.0 Z 00.0 REPLACED LEFT AND RIGHT HAND CUTTING 06.0 U C C A H Y N 7448 00.0 00.2 00.2 1 00.0 REPLACED FAULTY ROADSIDE TAIL LIGHT 07.0 U H O A H Y Y Z401 00.0 00.2 00.2 1 00.0 REPLACED FAULTY ROADSIDE TAIL LIGHT 08.0 U C C A H Y N 0609 00.0 00.2 00.2 1 00.0 REPLACED FAULTY ROADSIDE LIGHT 07.0 U H O A H Y Y Z401 00.0 00.2 00.2 1 00.0 REDACED CAPSCREW IN HYDRAULIC PUHP 07.0 U O O A H Y Y Z401 00.0 00.2 00.2 1 00.0 REDACED CAPSCREW IN HYDRAULIC PUHP 07.0 U O O A H Y Y Z401 00.0 00.2 00.2 1 00.0 REDACED CAPSCREW IN HYDRAULIC PUHP 07.0 U O O A H Y Y Z401 00.0 00.2 00.2 1 00.0 RECONECTED HOSE ON HYDRAULIC PUHP 07.0 U O O A H Y Y Z401 00.0 00.2 00.2 1 00.0 RECONECTED HOSE ON HYDRAULIC PUHP 07.0 U O O A H Y Y Z401 00.0 00.2 00.2 1 00.0 RECONECTED HOSE ON HYDRAULIC PUHP 07.0 U O O A H Y Y Z401 00.0 00.2 00.2 1 00.0 RECONECTED HOSE ON HYDRAULIC PUHP 07.0 U O O A H Y Y Z401 00.0 00.2 00.2 1 00.0 RECONECTED HOSE ON HYDRAULIC PUHP 07.0 U O O A H Y Y Z401 00.0 00.2 00.2 1 00.0 RECONECTED HOSE ON HYDRAULIC PUHP 07.0 U O O A H Y Y Z401 00.0 00.2 00.2 1 00.0 RECONECTED HOSE ON HYDRAULIC PUHP 07.0 U O O A H Y Y Z401 00.0 00.2 00.2 1 00.0 HYDRAULIC PUHP BETONED HOSE ON HYDRAULIC PUHP 07.0 U O O A H Y Y Z401 00.0 00.2 00.2 1 00.0 HYDRAULIC PUHP BETONED HOSE ON HYDRAULIC PUHP 07.0 U O O A H Y Y Z401 00.0 00.2 00.2 00.2 00.2 00.2 00.2 00

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DESCRIPTION	00.1 TIGHTENED ROTATING UNION CN REDUCTION 80x Clutch Control EPR F8-616	00.1 REHOVED AND ROTATED CUTTING EDGES AND REINSTALLED. REPLACED 7 BOLTS IN CENTER SECTION OF CUTTING EDGE. EPR FB-629	UTTING EDGE	00.1 REPLACED HOSE FITTING, HYDRAULIC DUMP BY PASS HOSE, NOTED! PART NOT LISTED IN IM EP? F3-644	G 900 HYDRAULIC PUHP BY PASS	00.0 PERFORMED 50 HOUR MAINTENANCE EPR F9-631	00.0 REMOVED EJECTOR ASSEMBLY REWELDED ROLLER RETAINER AND SUPPORT ARM REASSEMBLED EJECTOR ASSEMBLY EPR F8-621	A THE RESIDENCE AND ADDRESS OF A STREET WITH A STREET WAS ADDRESS OF THE PARTY OF T	00.0 INSTALL CLARK MODIFICATION TO PROVIDE A (S) FIVE SECOND DELAY TO PRCTECT THE HYDROSTATIC DRIVE EPR FB-775	00.0 INSTALLED TWO 1/2 INCH PIPE PLUGS IN HYDROSTATIC MOTOR ORILLED TWO 45/64 HOLES AND TAPPED FOR 1/2 INCH PIPE THREADS REFILLED HOTOR WITH OE-10 OIL REPLACED HYDROSTATIC DRIVE FILTER EPR F8-780	1/2 INCH, MAGNETIZED (6 QUARTS)	00.0 INSTALLED RETROFIT LINES ON HYDROSTATIC PUMP EPR FB-467(S-1)	INE
H B B B B B B B B B B B B B B B B B B B	01.0 2 00.	01.2 2 00.	BOLT ASSY CUTTING EDGE	01.6 2 00.	HOSE FITTIN	00.7 3 00.	08.7 3 00.	-	02.8 2 00.	02.7 1 00.	PLUGS, PIPE 1/2 INCH, OIL, OE 10 (6 QUARTS) CARTRIDGE	00.4 1 00.	HYDRAULIG LINE
ST. FAMECE1 TEST ITEM ,9%6 SEET 9 A C C C C C A A A C C C M A M S R OL LO A OU U H H T F F N Y OU MU H S S T C R R	U O O I M Y Y 0801 00.0 00.6	S O C A M Y M 7448 30.0 00.6	GP=000057448 NO=07 LIFF= UNK	U O O I H Y Y 2406 00.0 00.6	GP=000052406 NO=01 LIFF= 71.4 HOSE FITTING 900 HYDZAULIC PUHP BY PASS	S C C A H Y H 9000 00.0 00.3	UFFACY77448 00.0 04.7	the same of the sa	0 0 A C N N 2401 00.0 02.4	UFFICNN 2401 0112 02.7	GF=000052401 NO=02 LIFE=UNK NO00052401 000052401 05000	UFFACNH2406 00.0 00.4	GF=000052406 NO=02 LIFE=
03/05/79 MAINTENANCE TASK LOG TEST 0 S OHK A T S 0 A H DON C A / T T F OUD T S U E T MKS N K	27/01/78 1 147.5 011.0	28/01/78 1 156.8 012.0 5	PARTS 513450	30/01/76 1 163.1 012.1 U	PARTS 2548158	30/01/78 2 163.3 013.0	16.0	CKITICALITY PACTOR= 1.00	22/02/76 2 160.1 015.0 U	23/02/78 1 180.1 016.0 U	PARTS 1566344 HC9600FUF8H	23/32/78 1 180-1 16.04 U	PARTS UNKNOWN

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		DRAULIC FUMP ACTUATOR (SOLIO OX MOUNTED ON MP. EPR FB-1094	JUMP	00.0 PERFORMED SO HOUR MAINTENANCE EPR FB-865	00.0 REPLACED LEFT, RIGHT, AND CENTER CUTTING EJGES EPR FB-866	ON	N SECTION OF BOML ON		00.0 ADDED 8 1/2GALLONS HYDRAULIC OIL	1 REMOVE HYDRAULIC FITTING INSTALL NEM O RING REINSTALL FITTING ON MANIFOLD. PART NO. NOT AVAILABLE EPR F8-879	00.0 COMPLETED 250 HOUR MAINTENANCE. EPR	REDUCTION BOX Axle Poner cluster	WN TEAR ON SCRAPER BOWL AND ALONG THE SEPARATION EPR	00.0 REPLACES ROADSIDE TAIL LIGHT EPR FU-907	
	10130100010	D REPLACED STATE RELAY	GP=000052401 NO=01 LIFE=182.6 ACTUATOR, HYDRAULIC >U	.O PERFORMED FB-865	O REPLACED	EDGE, LEFT HAND EDGE, RIGHT HAND EDGE, CENTER	SCAPER EPR FB-883		O ADDED 8 1	00.1 REMOVE HY RING REINST PART NO. NO	FB-889	BREATHER, Breather, 1ent, Fl, P	O GROUND DO HELDED BEAD FB-883(S-1)	O REPLACED	LAMP, INCANDESCENT
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D3/D5/79 MAINTENANCE O S	L -	07/03/78 1 182.6	PARTS SA1205-03-00 CRITICALITY FACTOR=	13/03/78 1 198.5 01	13/03/78 1 198.5	2548784 2548783 2548786	15/03/78 2 221.1 01	CRITICALITY FACTOR=	16/03/78 1 227.7 01	17/03/78 1 228.1 02	20/03/78 1 251.0 021.0	569022-03 569022-03 AC43887	24/03/78 1 254.2	24/03/76 1 254.5 02	PARTS HS 35478-1683
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waan	877,877(5-1)	999		156		656	096		516	958(621-1)
DESCRIPTION	0.3 1 REPLACED CURBSIDE COMPOSITE LIGHT. EPR FB-877,877(S-1) COMPOSITE LIGHT, CURBSIDE REAR	REPLACED PROP SHAFT UNIVERSAL JOINT. EPR F8-888	UNIVERSAL JOINT	REPLACED EJECTOR CYLINDER. EPR F3-957	TLINDER	TIGHTEN OIL COOLER COVER HOUNTING SCREM. EPR FB-959	REPLACED REDUCTION GEAR BOX CLUTCH COVER GASKET. EPR F8-960	GASKET, GLUTCH COVER	REWELDED EJECTOR CYLINDER MOUNT TO EJECTOR APRON. EPR F8-933	RE-WELDED EJECTOR ROLLER MOUNT (ROADSIDE) TO EJECTOR APROR ARM, EPR FB-958 (621-1)
AH M DT NU N AH R GE		1.0 1	PROPSHAFT	1.0 2.0 2	EJECTOR EYLINDER	0.1 1	2.0 1	GASKET, CI	9.0	0.61
£0280	0.3 LIFE=	1.0	LIFE=251.0	1.0	LIFE=	0.1	2.0	- Ilee	9.0	9.0
LOG 1EST , FAMECEL TEST ITEM , 956 CO CO CO CO A / C C M A M S R OL L C C M A M S R OL L C C M A M S R OL L C C M A M S R OL L C C M A M S R OL L C C M A M S R OL L C C M A M S R OL L C C M A M S R S T C C M C C C C C C C C C C C C C C C C	5 22.1 U O O A M Y H 0608 GP=000050608 NO=01 LIFE=	5 22.20 U O O A Y Y 0900	GP=000050900 NO=01 LIFE=251.0 PROPSHAFT UNIVERSAL JOINT	0 023.0 U O O A M Y Y 2407	GP=000052407 NO=01 LIFE=	266.0 023.04 U C C A N N 1501	266.0 023.08 U F F A Y Y 0801 FACTOR= 1.00	GP= 051801 NO=01 LIFF=	266 23.0C U O O A Y N 7448	266 23.00 U O O A Y 7448 CTOR= 1.00
03/05/79 MAINTEMANCE TASK LOG 0 S OHR A A H DON C T F OUD T E T HRS N	24/03/78 1 254.5 22.1 U	24/03/78 1 254.5 22.20 U	PARTS 114-4143A	28/03/78 1 266.0 023.0	PARTS 2545323	28/03/78 266.	28/03/78 266.0 023.08 CRITICALITY FACTOR= 1.00	PARTS SK-67537	28/03/78 26/	28/03/78 266 23.00 CRITICALITY FACTOR= 1.00

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			~	DESCRIPTION		00.0 INSTALL ROPS EPR F8-680 68	00.0 INSTALL WINDSHIELD ASSY EPR FB-680 68	00.0 INSTALL CAB FRAME + CANVAS COVER EPR 68	00.1 ADDED 1 GALL/H ANTI-FREEZE MIX TO COOLING SYSTEM	00.0 ADDED (1) ONE GALLON DE-10 TO TRANSMISSION SUMP	00.0 ADDED 1 GAL. OF TRANSMISSION FLUID.	00.0 ADDED 1 GAL. ENGINE OIL.	00.0 DISASSEMBLE FOR SHIPMENT TO NATICK FOR 75 AIR DROP REMOVE ROPS 2MENX.3HRS=.6HRS REMOVE CAB + CANVAS COVER 2. PROV. CAB + CANVAS COVER 2. PROV. CAB + CANVAS REMOVE WINDSHIELD ASSY 4. FASSTEN ONHOOD ZMENX.4HRS=.8HRS EPR	00.0 DISCONNECTED FUEL LINES AT FILTERS, 55 BLEW DUT LINES WITH AIR, AND REASSEMBLED EPR F8-551	00.0 REPLACED SECONDARY FUEL FILTERS CEANED 55 PRIMARY FUEL FILTER EPR F8-551	FUEL	DO.O TIGHTENED NUT ON THE GOVERNUR. ADJUSTMENT ROD AND ADJUSTED ENGINE SPEED EPR F8-552(S-1)	00.0 RE-MOUNT WINDSHIELD ASSEMBLY, CAB FRAME 59 AND ROPS EPR FB-596
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DESCRIPTION	88.0 400ED 5 GALS OF HYDRAULIC FLUID.	08.0 AUDED 2 GAL OF TRANSMISSION FLUID.	DO.1 RECONNECTED WIRE TO COOLANT LEVEL INDICATOR EPR F8-647	00.0 ADDED 2 GALLONS TRANSMISSION DIL	00.0 REPLACE BURNED OUT CURBSIDE FLOODLIGHT LAMP EPR FB-728	LAMP, FLOODLIGHT )	00.1 TIGHTENED BOLTS IN THE VARIABLE DISPLACEMENT STEERING PUMP EPR F8-745	00.0 PERFORMED 50 HOUR MAINTENANCE ADDED 12 ML DEID TO MIDMOUNT BEARING EPR F8-744	00.0 ADDED 1 GALLON TRANSMISSION DIL	00.0 ADDED 2.5 GALLONS OF HYDRAULIC OIL	00.0 TIGHTENED DIRECTIONAL CONTROL SWITCH HOUNTING 30LTS EPR FB-778	00.0 ADDED 2 GALLONS ENGINE DIL	00.0 ADDED 1 GALLON HYDRAULIC OIL	88.8 ADDED 1 GALLON TRANSMISSION OIL	88.8 ADDED 2 QUARTS ENGINE OIL	88.8 ADGED 1 GALLON TRANSMISSION OIL	00.0 ADDED 2 QUARTS ENGINE OIL	00.0 ADDED 1 QUART ENGINE OIL
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		18-834 834 ILIC 836 EPR	L L 877	ADJUST 861	o		959 54 03	186	106 , 901	Ę
NOT	00.0 ADDED 2 QUARTS HYDRAULIC OIL 00.0 PERFORMED INSPECTION ON HYDRAULIC SYSTEM (FR F8-804	00.0 PERFORMED 50 HR HAINTENANCE EPR FB-834 00.0 AUDED 10 GALLONS OF DIL TC HYDRAULIC SYSTEM OIL LOST DURING PUMP REPAIR EPR FB-836	00.0 ADDED 1.5 GALLONS OF HYDRAULIC OIL 00.1 ADJUST DOLLY WHEEL HYDRAULIC SYSTEM PRESSURE TO 2100 EPR F8-872	00.1 CHECK STEER SYSTEM PRESSURE, AND ADJUST PRESSURE TO RECOMMENDED 2500 FSI EPR F8-861	GALS OF FLUID TO HYDRAULIC	BO.O ADDED 4 QUARTS OF ENGINE CIL	00.0 PERFORMED SO HOUR MAINTENANCE ADDED 45 HL OF OIL TO MIDMOUNT EPR FE-856	00.0 ADDED 1 GALLON TRANSMISSION OIL 00.0 REMOVED ROPS, CANVAS, CAB AND MINDSMIELD EPR F8-887	00.1 REPLACED INCANDESCENT LAMP, ROADSIDE, CMPT FRONT LIGHT EPR FB-901	LAMP INCANDESSENT, CMPT FRONT LIGHT, ROAD- SIDE
TI AM GE DESCRIPTION	00.0 ADDED 2 QUARTS 00.0 PERFORMED INSPE	00.0 PERFORMED 00.0 AUDED 10 SYSTEM OIL FB-836	00.0 ADDED 1. 00.1 ADJUST PRESSURE	00.1 CHECK S PRESSURE FB-861	00.1 ADDED 2 RESERVOIR	80.0 ADDED 4	00.0 PERFORM	00.0 ADDED 1	00.1 REPLACE	CANDESCENT, C
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MAINTENANCE TASK LOG TEST , FAMECEL TEST ITEM , 9  D S OHR A T S E E T Q A C G CO A H DON C A / C C H A H S R OL T F OUD T S U H H T F P HY  E T HPS N K R S T	.957 CH HH LO 00 OU NU KS RS	H DI E II N A AM GE DESCRIPTION	
031.0A U C C A H N N 0000 00.0	00.3 00.3 1	1 00.0 ADDED 2 GALLONS LUBRICANT TO FRONT DIFFERENTIAL.	
04/04/78 250.0 032.0 U H F A Y Y 1102 CRITICALITY FACTOR: 1.00	0.9 1.8	3 2 REPLACE DIFFERENTIAL SEAL EPR FB-966	996
GP=000011102 NO=01 LIFF=		SEAL DIFFERENTIAL IMPUT	
250.0 032.04 U C C A N N 0708	0.1 0.1	L 1 TIGHTEN HYDRAULIC LINE AT TORQUE CONVERTER EPR F8-967	196
250.0 032.08 U C C A N N 2406	0.1 0.1	1 1 TIGHTENED GLOBE VALVE PACKING RETAINER. EPR F9-967	196
250.9 032.0C U C C A Y N 2406	0.1 0.1	I 1 TIGHTEM FITTING ON LOWER HYDRAULIC LINE AT GOLLY WHEEL CYLINGER EPR F8-367	196
250.0 032.00 U C C A H N 0612	1.0 1.0	1 REMOVED BATTERIES; CLEANED AND SERVICED BATTERIES + BOX; REPLACED BATTERIES EPR FB-967	196
250.0 032.0E U O O A N N 0612	0.5 0.	0.2 1 REHOUNTED BATTERY CABLES. CARLES IMPROPERLY MOUNTED. EPR FB-967	196
256.0 032.0F U 0 0 A Y N 1410	0.1 0.	0.1 1 REPLACED STEERING COLUMN HOUNTING BOLF. EPR FB-967	196
GP=000011410 NO=01 LIFE= 000011410 01	250	SCREW, CAP WASHER, FLAT	
250.0 032.06 U C C A Y N 2406	0.1 0.1		196
250.0 532.0H U O O A N N 2202	0.2 0.2	2 1 CLEANED WINDSHIELD WIPER POTOR FILTER.	196
250.0 032.01 U O O A H N 0108	0.5 0.	0.5 1 TIGHTENED TURBOCHARGER HOUNTING BOLTS ON THE EXHAUST HANIFOLD. EPR F8-967	196

	wa	αu	751	738	3 744	904	936		934	*50		959 06	PR 616(S		669 661	
		DESCRIPTION	00.0 TIGHTENED 4 BOLTS IN RIGHT HAND SPRAY VALVE ASSEMBLY EPR FB-751	00.0 TIGHTEN LOOSE AIR LINE FITTING EPR FB-738	00.0 PERFORMED 50 HOUR MAINTENANCE ADDED 9 ML 0E10 TO MIDMOUNT EPR F8-744	00.0 PERFORMED INSPECTION ON HYDRAULIC SYSTEM EPR F0-804	00.0 REHOVE MATER PUHP-DISASSEMLE PUHP, INSTALL SEAL ,SPRING AND SLINGER. RE-ASSEMBLE PUHP AND REHOUNT IN TANK. EPR FB-836		00.0 PERFORMED 50 HOUR MAINTENANCE EPR F9-834	00.0 REPLACED BLOWN CURBSIDE REAR TIRE EPR FB-854	MATIC	00.0 PERFORMED SO HOUR MAINTENANCE ADDED 9 HL OF OIL TO HIDMOUNT EPR F8-856	00.0 REPLACED BOTH REAR COMPOSITE LIGHTS EPR FB-916 (S-1)	COMPOSITE	00.0 REPLACED CURBSIDE SPRAY HEAD EPR F8-839	
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	u	<b>a</b>	~	s		932	172(5-1)					934	934
					DESCRIPTION	MELDED SHALL CRACK ON HYDRAULIC HOSE ADAPTER. EPR FB-932	2.0 4.0 2 0.5 MACHINED 0.010" FROM PLUNGER COVERS ON 77215-1) MAIN HYDRAULIC CONTROL VALVE AND REPLACED 0-RING . EPR F8-772(5-1)		PACKING PREFORMED	PACKING PREFORMED	REFORMED	TIGHTENEO BOTH RIGHT AND LEFT SPRAY NOZZLES EPR F8-934	TIGHTENED HYDRAULIC LINE COUPLING AT THE MANIFOLD. EPR F8-934
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G3/05/79 HAINTEHANCE TASK LOG	S	I	•	-		04/04/78 0 251.0 011.0	82/50/50	SRITICALITY FACTOR= 1.00	PARTS 4848X35	A791X23	A791X	04/04/78 0 251.0 11.08 U C C A	04/04/78 251.0 011.0C U C C A
MAIN	0	A	-	F		750	130	ERIT	PAR	-		1.0	140

	DESCRIPTION	00.0 INSTALLED CANVAS CAB COVER FPR F9-760	00.0 INSTALLED ROPS EPR FB-760	00.0 INSTALLED CAB SUPPORTING STRUCTURE EPR	00.0 INSTALLED WINDSMIELD ASSY EPR F8-760	88.8 ADJUSTED PARKING BRAKE EPR F8-761	00.0 ORAINED 2 GALS OF TRANSMISSION FLUID.	VEHICLE INTO HEATED BUILDING LINES AND FILTERS. EPR	9 REPLACED MISSING CLEUIS PIN + COTTER PIN IN THROTTLE SLAVE CYLINDER EPR FB-76			NTIFREEZE	DO.O PERFORMED SO HR. MAINTENANCE EPR FB-764	GALLON OE-10 TO TRANSHISSION	00.2 REPLACED GASKET (PREFORMED PACKING) IN TRANSMISSION FILTER ASSY EPR F8-451	ON FILTER ASS	02.0 REPLACED VENT ASSEMBLY BREATHER CHECK LUBRIJANT LEVEL IN AXLE ASSEMBLY-NONE ADDED EPR FB-452	
		=	INST	D INSTALL	INSTALLED	ADJUSTED PA	DRAINED 2 GA	00.5 HOVED TEST VEI TO THAM FUEL LI FB-569	00.9 REPLACED MISSING CLEUIS PIN PIN IN THROTTLE SLAVE CYLINDEI FB-76			00.1 1 00.0 ADDED 4 GAL OF ANTIFREEZE	PERFORMED SO HR.	00.1 ADDED 1 GALLON O	2 REPLACED GASKET (PREFORMED TRANSMISSION FILTER ASSY EPR	PACKING, PREFORMED TRANSHISSION FILTER ASS	O REPLACED VENT ASS LUGRISANT LEVEL IN ADDED EPR F8-452	VENT ASSY BREATHER AKLE ASSY
	01 E M 11	0.00	0.00	00.00	0.00	0000	0.00	00.5 TO	90.9 FB	1	CLEVIS	000	0.00	00.1 RE	00.2	, PREF	02.0 LU	SY BRE
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36/01/78 1 112.0 011	112.0	011.0	5	4		4	<b>r</b>	-	Y 1410	10	0.00	00.3	8 00.3	4	00.2	VARIAB	00.2 INSTALLED COVER PLATE AND VARIABLE DISPLACEMENT STEER	SPLAC	ER PL	ATE A	ER PL	GASKET ON PUMP EPR		527
CRITICALITY FACTOR= 1	FACTO	P= 1.00	-													136-9								
FARTS UNK	1		1	CP =	10	0	111	1,	0 10	0=0	LIF	011410 NO=01 LIFE=UNK	CUP	BEA	RING,	COVE	R PLA	TE.	CURBS	10E R	EAR C	CUP BEARING, COVER PLATE, CURBSIDE REAR OF TRANSHISSION.	HISSI	ON.
11/91/78 2 112.2 912	112.2	012.0	v	S	S	4	z	Z	N 0000	00	0.00	1.00	1 1.00 1	-	00.0	ADDE	00.0 ADDED 4 1/2 GALLONS HYDRAULIC OIL	12 61	MILLON	IS HYD	RAULI	10 01		
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PARTS 4880				3	0 =	000	10	9	9 10	0=0	1 116	GP=000010609 NO=01 LIFE=UNK	LAMP, SEAL			BEAM								
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18/01/76 1 138.6 016	136.6	016.0	S	0	0	4	Y	2	0000 X	00	0.00	02.2	2 4.40	~	621	INDSH UHP T	O REMOVED ROPS, REMO WINDSHIELD ON HOOD II HUMP TEST EPR F8-563	ON HO	REHO 300 1	N PRE	PARA	00.0 REHOVED ROPS, REHOVED CAB, HOUNTED WINDSHIELD ON HOOD IN PREPARATION FOR HUHP TEST EPR F8-563		563
19/01/78 1 138.6 017 CRITICALITY FACTOR: 1	136.6 FACTO	017.0 R= 1.00	>	0	0	-	-	-	H Y Y 1410	10	0.00	00.1	00.1 1	-		RESE ISPLA	00.0 RESEALED BEARING CAP ON VARIABLE Displacement punp epr F3-527 (S-1)	BEAR T	THE C	AP ON	527 (	148LE (S-1)		225
04/02/78 2 143.8 019	143.8	018.0	5	<b>L</b>		4	-	-	C Y Y 1501	10	0.00	16.1	12.1	<b>m</b>	0.18	REPL YDRAU RACKE	O REPLACED BROKEN TOP MOUNTING BR HYDRAULIC RESERVOIR WITH MOOIFIED BRACKET 3/8" THICK EPR F8-545	ESER!	YOIR ICK E	WITH PR FB	NT ING HOOIF 1-545	00.0 REPLACED BROKEN TOP MOUNTING BRACKET HYDRAULIC RESERVOIR WITH MODIFIED BRACKET 3/8" THICK EPR F8-545	NC L	549
KILICALIE	1																							

Mean	709	111			708		121				135	122		727
OESCRIPT 10M	CANVAS AND SIDE VIEW MIRROR (THE A30VE ITEMS HAD BEEN DISASSEMBLED AND REMOVE D. WITH EXCEPTION OF THE MINOSHIELD, PRINCE OF PERFORMING THE DATE DATE DATE OF THE OFFICE OF THE DATE OF THE OFFICE OF THE OFFICE OF THE OFFICE OF THE OFFICE OFFICE OF THE OFFICE OF THE OFFICE OFFI	PERFORMED 50 HOUR MAINTENANCE EPR	80.0 ADDED 2 OTS OF ENGINE OIL.	88.8 ADDED 1 GALLON OF HYDRAULIC OIL	00.0 OPERATED THROTTLE BY HAND AND USED ETHER TO START ENGINE EPR FB-708	00.1 ADDED 3 GALLONS OF HYDRAULIC FLUID	00.0 INSTALL NEW KNOB (CONNECT + DISCONNECT) EPR F9-727	00.1 ADDED 3 GALLON HYDRAULIC FLUID TO RESERVOIR	88.1 ADDED 1 GALLON OIL TO ENGINE	BO. D ADDED 1 GAL. OF TRANSMISSION DIL.	00.0 PERFORMED 50 HR MAINTENANCE PER LOS-3840-261-12. ADDED 8 HL OF OIL TO THE MIDHOJNT BEARING. EPR F8-735	00.0 REPLACED BURNED OUT PANEL LAMP EPR FB-722		
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MAINTENANCE TASK LOG- D S OHR A A H DON C T F OUD T E T MRS N	04/02/78 1 144.1	04/02/76 2 154.8	06/02/78 1 160.1	06/02/78 2 162.3	07/02/76 1 162.5	09/02/78 1 188.0 0	7.661 2 87/20/60	10/02/78 1 199.7	10/02//0 1 199.7	10/02/78 2 213.9	11/02/78 1 213.7	11/02/78 2 213.7	PARTS H4489	
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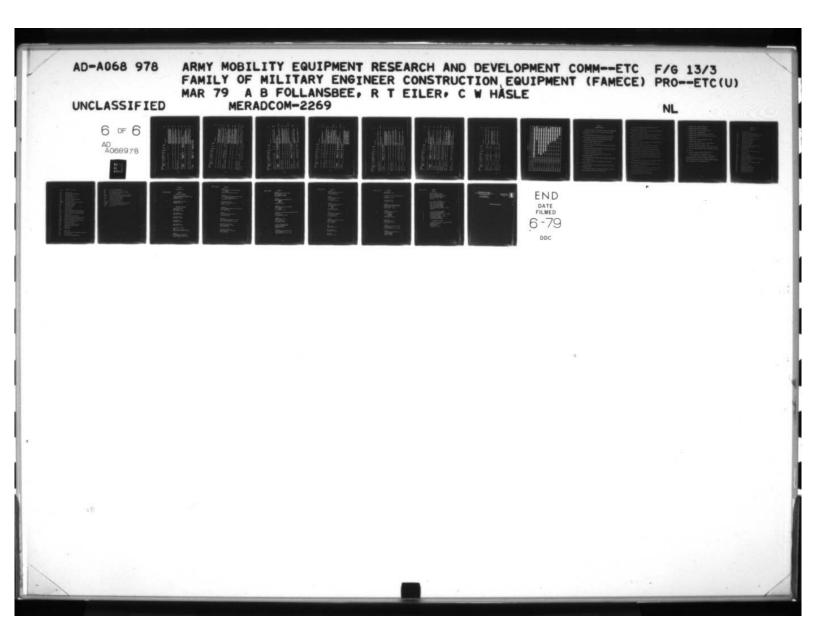
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	DESCRIPTION	00.0 REPLACEO DEFECTIVE THERMO SWITH EPR FB-724	HERMO 00.0 ADDED 3 QUARTS OF ENGINE CIL	00.0 ADDED 1.5 GALLONS OF TRANSMISSION DIL	00.0 ADDED 1 1/2 GALLONS TRANSHISSION DIL	250 HOUR MAINTENANCE. EPR FB-1113	ENT, DIL, FULL FLOM ENT, DIL, BYPASS FUEL FILTER ENT, DIL, TRANSHISSION ENT, MATER, CORROSION RESIST ENT, HATER, HOMT BREATHER, HOMT BREATHER, AXLE FOR STANSHISSION FOR STANSHISSION FOR STANSHISSION FOR STANSHISSION FOR STANSHISSION	1	00.0 ADDED 1 1/2 GALLONS OF TRANSMISSION OIL 00.0 REPLACED TRANSMISSION REAR COVER GASKET ADDED 7 GALLONS TRANSMISSION OIL EPR FB-771(S-1)		the manufacture of the state of	<b>a</b>	150	HED	PISTON RING, CLR SOFF DIL. TRANSMISSION (7 GALLONS)
H 07 R 17	<b>w</b>		-		1	~	SY CELER	3				ET, BRG. CAP	PACKING, PREFORMED	PACKING, PREFORMED	DISTON RING, CLR SOFT
HAN		00.9 00.9 1	SWITCH 00.1 00.1 1	00.2 00.2 1	1 1.00 1.00	0.9 1.8	FILTER FILTER CARTRIO FILTER FILTER VENT AS	00.1 00.1 1	14.9 31.4 3		GASKET	GASKET,	PACK	PACK	011.
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		н ү ү об13	GP=000010613 NO=01 LIFF= C C A M Y N 0000 00.0	H Y 0000	9 Y N 0000	H Y N 0000	GP=000010106 NO 000010106 000010309 000010721 000010500 000011000	0000 N N E	M Y N 0000 C Y Y 0710		8	7010000	0000107	1010000	0000107
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03/05/79 HAINTENANCE TASI D S OHR A H DON T F OUD	T MRS	11/02/78 2 213.7 02	PARTS 6402718 14/02/78 2 238.7 02	14/02/78 2 244.9 02	15/02/78 1 248.4 27.0	15/02/78 2 255.3	75 MS-35802-3 931 5678 LF-511 29908 AC43887 569022-03	16/02/78 1 260.8 02	17/02/78 1 273.5 02 24/02//8 1 276.8 02	CRITICALITY FACTOR=		232484	25K040026	25K030016	208758 N/4
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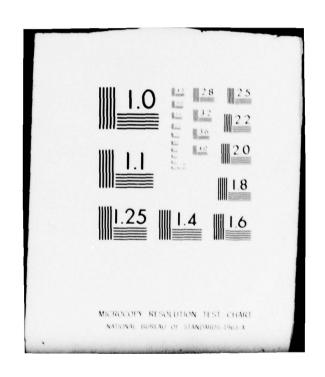
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					RETORGUED TRANSHISSION END COVER CAP SCREWS EPR F8-1093	00.3 ADJUSTED COUPLER CYLINDER LOCKING PRESSJRE EPR F8-868	00.0 ADDED 1 GALLON OF OIL TO ENGINE SUMP.	00.1 ADDED 4 GALLONS OF FLUID TO HYDRAULIC RESERVOIR	PERFORMED SO HOUR SERVICE. EPR F8-839	00.1 REMOVED DAMAGED DOLLY CYLINDER, INSTALLED NEW DOLLY CYLINDER, EPR FB-871	DOLLY SYLINDER, DOLLY WHEEL SUSPENSION	00.0 REPLACED DOLLY WHEEL TIRE, TUBE AND WHEEL EIAP, CUBRATOR, EPP FRAAT		TIRE 18X9-8 TUBE-DOLLY WHEEL FLAP-DOLLY WHEEL	00.0 RE-IIGHTEN LOOSE HOSE FITTING ON MASTER CYLINDER EPR F8-846	00.0 ADDED 1 QUART OF ENGINE OIL	00.0 TIGHTENED DOLLY WHEEL RETAINING NUT TO REMOVE LOOSENESS EPR FB-881	00.0 AUJUSTED SERVICE BRAKES EPR F8-875	00.0 PERFORMED 50 HOUR MAINTENANCE EPR
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	GALLON TRANSMISSION OIL SERVICE EPR F9-890	ROPS AND CAB IN PREP. FOR	REPLACED HYDRAULIC STEERING CYLINDER. R f8-937	AUST PIPE CLAMP AT	TIGHTENED BOLTS ON TRANSHISSION BEARING P. EPR FB-939	TIGHTENED TRANSMISSION MOUNTING BOLT. R FB-939	REPLACED HYDRAULIC BRAKELINE FITTI MASTER CYLINDER, FITTING HAD BEEN GROSS-THREADED AND WAS LEAKING BRAKE FLUID WHEN BRAKES WERE APPLIED, EPR FB-939		REPLACED MIDMOUNT BREATHER. EPR FB-939		TIGHTENED OIL LINE FITTING ON TURBOCHARGER EPR F8-939	REPLACED BULB IN DASH LIGHT. EPR FB-939
DT IIT AM GE OESSRIPFION	00.0 ADDED 1 GALLON	REMOVED IPHENT E	REPLACED HYDRA	CYLINDER, STEERING. 0.1 1 TIGHTENED EXHAUST PIPE TURBOCHARGER. EPR FB-939	TIGHTENED BOLT	TIGHTENEO TRAN EPR F8-939	REPLACED HYDRA MASTER CYLINDER CROSS-THREADED A FLUID WHEN BRAKE FB-939	ADAPTER, BRAKE LINF.	REPLACED MIDMO	REATHER ASSY	TIGHTENED OIL TURBOCHARGER EPR	REPLACED BULB
T W Z	00.00		0.7 1	CYLINDER 0.1 1	0.1 1	0.1 1	0.11	ADAPTER,	0.1 1	-	0.1.1	0.1 1
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MAINTENANCE TASK D S OHE A H DON T F OUD E T HPS	14/03/78 1 362.5	20/03/78 1 402.7	05/04/78 40	PARTS 2548108 05/04/59 40	05/04/78 40	05/0:178 40	05/05/78 40	PARTS FC-2932	05/04/78 407.0	05	05/04/78 40	05/04/78 40

mean	764	531			573(5-1		602	11111	735	736	1110	***	746	838
	50 HR. MAINTENANCE EPR FB-764	ON DUMPER BODY TO MOUNT FB-531	IN RIGHT HAND TAIL LIGHT		ROADSIDE TAIL LIGHT		100.0_SET_UP_ROCK_GUARDROCK_GUARD_HAD_BEEN_ LOWERED INTO STOWAGE POSITION DURING PERFORMANCE OF THE RAILROAD IMPACT TEST. EPR FB-709	50 HOUR MAINTENANCE EPR	MAINTENANCE PER DOED 87 HL OF OIL TO NG. EPR F8-735	T ON THE AIR CHAMBER	250 HOUR MAINTENANCE. EPR FB-1110	CLUSTER	N QUICK RELEASE PIN D NUT EPR F8-746	R MAINTENANCE EPR
DT IT An Ge description	00.0 PERFORMED 50 HR.	00.0 WELDED ABRACKET ON DUMPER BACK-UP ALARM EPR F8-531	00.0 REPLACED BULB IN EPR FB 541(S-1)	INCANDESANT	00.0 REPLACED BROKEN ROADSIDE ASSEMBLY. EPR FB-573(S-1)	50.3 LIGHT, COMPOSITE	LOGO DE SET UP ROCK GUARD, ROCK GUARD HA LOMERED INTO STOWAGE POSITICN DURI PERFORMANCE OF THE RAILROAD IMPACT TEST, EPR FB-709	COMPLETED 50 HOU FB-1111	00.0 PERFORMED 50 HR MAINTENANCE PER LO5-3840-208-12. ADDED 87 HL OF O THE YIDHOJNT BEARING. EPR F8-735	00.0 TIGHTEN LOOSE NUT ASSEMBLY EPR F8-736	250 HOUR MAINTEN	ASSY, BREATHER, MIDMOUNT ASSY, BREATHER, AXLE R ELEMENT, FL, POWER CLU	00.0 SUBSTITUTE BROKEN HITH 1"X4" BOLT AND	00.0 COMPLETED 50 HOUR
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		ION	00.0 PERFORMED 50 HOUR MAINTENANCE EPR	00.4 ADJUSTED TAILGATE LATCH ASSEMBLY EPR		00.0 50 HOUR SERVICE EPR F8-890	00.0 REPLACED SHELL ON ELECTRICAL CONNECTOR ON WIRING HARNESS EPR F8-882	FLEC. CONNECTOR, SHELL MIRING HARNESS M.S.	REPAIRED SURBSIDE COMPOSITE REAR LIGHT. EPR F3-693		ROADSIDE ROCK GUARD CABLE EPR	GUARD	CABLE GUIDE BRACKET ON DUMPER EPR FB-921	MIDMOUNT BEARING BREATHER. EPR		TIGHTENED MIDMOUNT BEARING FILLER PLUS. R F9-936	REPLACED HYDRAULIC-AIR POWER CLUSTER, R F8-1029	
		DESCRIPTION	DO.O PERFORME	00.4 ADJUSTED	18-89-6	00.0 50 HOUR	DO. D. REPLACED ON WIRING	NNECTOR, SHEL	00.0 REPLACED REPAIRED 3 EPR F3-693	COMPOSITE REAR LIGHT	00.1 REPLACED FB-910	ASSEMBLY, ROCK GUARD	00.0 REWELDED BODY ASSY.	REPLACED FB-936	VENT BREATHER	TIGHTENE EPR F9-936	REPLACED EPR FB-1029	AR CLUSTER
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		GE DESCRIPTION	PERFORMED 50 HOUR MAINTENANCE CHECK AS REQUIRED BY LUBE ORDER 1. CHECKED FLUID LEVEL IN MASTER CYLINDER LEVEL OK 2. ADDED 25HL OE/HOO TO MICHONIT BEARING. 3. ADDED GREASE TO ALL GREASE FITTINGS ON BUSKET. EPR FB-1069	00.0 STOPPED VEHICLE WHILE EARTH MOVING TO TIGHTEN LOCK NUT ON BUCKET DUMP CONTROL. EPR F9-1067	90.1 TIGHTENED LOOSE ELECTRICAL CONNECTION ON SOLENOID CONTROLLING ROLL BACK LEVER. EP? F8-97	00.0 TORQUED 20 WHEEL LUG BOLTS- (3 WHEEL LUG BOLTS WERE ALL THE WAY OUT OF WHEEL.) EP? FB-55	250 HOUR MAINTENANCE. EPR FB-1090	VENT ASSY, BREATHER, HIDMOUNT VENT ASSY, BREATHER, AXLE FILTER ELEMENT, FL, POWER CLUSTER	00.0 REPAIRED ELECTRICAL PLUG FOR INTERCONNECTING ELECTRICAL SYSTEMS BETWEEN POWER SECTION AND LOADER WORK SECTION. EPR F8-102	00.0 50 HOUR MAINTENANCE ADDED 40 ML OIL TO HOMT BEARING. EPR F8-117	00.0 REPLACED ALL BUCKET FEETH ASSEMBLIES EPR FB-132	UNK SCREW, CAP, HEX HEAD UNK SCREW, CAP, HEX HEAD
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T H E DESCRIPTION	00.0 RE-THEED END OF BUCKET BOOM CONTROL ROD BECAUSE THE CONTROL ROD BROKE REINSTALLED ON MACHINE EPR F8-164	00.1 TIGHTENED HYDRAULIC MANIFCLD FITTING. EPR F9-188	80.0 REPLACE LUBRICATION FITTINGS IN BLADE AND CLAM ASSY HINGE PIN ON THE ROAD SIDE. EFR FB-198	FITTING, LUBRICATION ROADSIDE OF BUCKET AT HINGE	00.0 50 HOUR SERVICE. EPR FB-1045	60.0 RIGHT FRONT FENDER DENTED, CAUSING THE FENDER TO BE TORN FRON 2 OF 175 4 HOUNTING BOLTS THE TORN AREAS OF THE FENDER WAS RENOUNTED EPR F8-169	10.0 RE-THREAD BUCKET DUMP CONTROL ROD + INSTALL - THE ROD HAD BROKEN OFF WEAR THREADED END. EPR FB-208	NTH ANGLE I RON TO GIVE IT STRUCTURAL SUPPORT, AND REMOUNTED USING BOLTS AND NUTS RATHER THAN SPOT WELDING. EPR	00.0 REMOVED BUCKET TEETH. TEETH EXCESSIVELY MORN, EPR FB-351(132-1)	PERFORMED SO HOUR SERVICE. EPR F9-1047	00.0 INSTALL NEW TEETH ON BUCKET EPR F9-151(5-1)	
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			DESCRIPTION	60.0 REPLACED LUBRICATION FITTING ON CURSIDE CYLINDER ASSEMBLY EPR FB-376 (S-1)	FITTING, LUBRICATION	00.0 REMOVE BOOM PIN- GREASE + REINSTALL PIN MAS DRY FROM LACK OF GREASE EPR FB-377	18.9 50 HOUR MAINTENANCE ADDED 30 ML OF LUBRICANT TO MIDMOUNT N. S. ADDED 3 02 BRAKE FLUID TO MASTER CYLINDER RESERVOIR EPR F8-380	DO. D BUCKET 401ST CONTROL ROD FAILED AT THEADED END. CONTROL ROD MAS RETHREADED AND REINSTALLED. EPR F8-362	00.0 REHOVEO BUCKET TEETH FROM SHANKS, TURNED TEETH OVER AND REINSTALLED ON SHANK AND LOADER. EPR F8-3831365-11.	DO.O 250 HR MAINTENANCE MIG MOUNT BEARING LUBRICANT OK EPR F8-391	CF=DD0030900 NO=01 LIFE=250.2 VENT ASSY, BPEATHER, MICHOUNT 000051000 01 250.2 VENT ASSY, BPEATHER, ARLE 000031204, 01 250.2 FILTER ELEMENT, FL, POWER CLUSTER	64.8 REPLACED BUCKET TOOTH TIPS. EPR. F3-510(132-3).	И100	00.0 PERFORMED 50 HR HAINTENANCE PER LUBE ORDER LOS203-12, DURING PERFORMANCE OF THE 50 HR HAINTENANCE 112 HL OF HEAVY DUTY OIL WAS ADDED TO HID-HOUNT DEARING, E MOVED DIRT AND MUD FROM	DOUPLER SECTION. GREASED FITTING ACCORDING TO THE LUGE ORDER. CHECKED HASTEP CYLINDER AND FOUND II HAD THE REQUISED AMOUNT OF BRAKE FLUID. EPR
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APPENDIX E

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#### APPENDIX G

#### ABBREVIATIONS

Aa Achieved Availability

AAR Association of American Railroads

ACE Army Aviation Communications Electronics Board

AMSAA Army Materiel Systems Analysis Agency

APG Aberdeen Proving Ground

ASTM American Society for Testing Materials

ATE Automatic Test Equipment

BOC Best Operational Capability

CEC Clark Equipment Company

DA Department of the Army

DARCOM Materiel Development and Readiness Command

DEP Draft Equipment Publication

DP Development Plan

DS Direct Support

DSMA Duration of Scheduled Maintenance Actions

DT Development Test

DTP Detail Test Plan

EDT Engineer Design Test

EPR Equipment Performance Report

FAMECE Family of Military Engineer Construction Equipment

FFR FAMECE Failure Report
FSD Full-Scale Development

FSMA Frequency of Scheduled Maintenance Actions

GS General Support

GVW Gross Vehicle Weight

HFE Human Factors Engineering

IER Independent Evaluation Report

MAC Maintenance Allocation Chart

MAV Minimum Acceptable Value

MCF Mission Criticality Factors

 $\underset{\text{max}_{\text{ct}}}{\text{M}} \qquad \qquad \text{Maximum Time to Repair}$ 

MN Materiel Need

MOS Military Occupational Specialty

MR Maintenance Ratio

MTBF Mean Time Between Failure

MTL Maintenance Task Log

MTSP Maintenance Test Support Package

MTTR Mean Time to Repair

NARADCOM Natick Research and Development Command

NET New Equipment Training
NSN National Stock Number
OEM On-Equipment Material

OT Operational Test
PM Project Manager

PMCS Preventive Maintenance Checks and Services
PQT-C Prototype Qualification Testing-Contractor
PQT-G Prototype Qualification Testing-Government

PS Power Section

QMR Qualified Materiel Requirement

RAM-D Reliability Availability Maintainability Data

RDAT Research and Development Acceptance Test
RDT&E Research, Development, Test and Evaluation

ROPS Rollover Protective Structure

R/M Revolutions per Minute

RPSTL Repair Parts and Special Tools List

SAE Society of Automotive Engineers

S.D. Smooth Drum

SF System Failure

SIDTC

ST Standby Time

TCM Total Active Corrective Maintenance (Unscheduled)

TDP Test Design Plan

TEA Transportation Engineering Agency

TECOM Test and Evaluation Command

TIWG Test Integration Working Group

TMDE Test, Measurement, and Diagnostic Equipment

TOP Test Operations Procedure

TOP/MTP Test Operations Procedure/Material Test Procedure

.

TPM Total Active Preventive Maintenance (Scheduled)

TRADOC Training and Doctrine Command

UAM Unscheduled Active Maintenance

UET Universal Engineer Tractor

USAARENBD U.S. Army Armor Engineer Board

USACEBD U.S. Army Communications Electronics Command

USAHEL U.S. Army Human Engineering Laboratory

WS Work Section

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